COACHING CLASS ON

Management Accounting & Financial Management

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Meet the Coach:

2012-Till to Date
Managing Director's Secretariat
Corporate Investment Division
Financial Administration Division as Divisional Head

2012
Head of Audit and Risk Rating
Risk Management Division

2006-2012
Chief Rating Officer (CRO)

2005-2006
Assistant Professor
School of Business

2003-2005
Lecturer
School of Business

Meet the Keynote Coach:

BBA, MBA (Major in Banking)
Department of Finance & Banking,
University of Dhaka

Fellow Member
Association of Chartered Certified Accountant

Fellow Member
Certified General Accountants of Bangladesh

Diplomat Associate
The Institute of Bankers, Bangladesh

Discussion Summary

- **Summary of Course Contents**
- **Exam Pattern**
- **Examiner’s Review/Report**
- **Exchange of Views**
- **Understanding the Basics**
- **Problems and Solutions**

Statistics 1: Success Rate of Part-II Exams (November 2022)

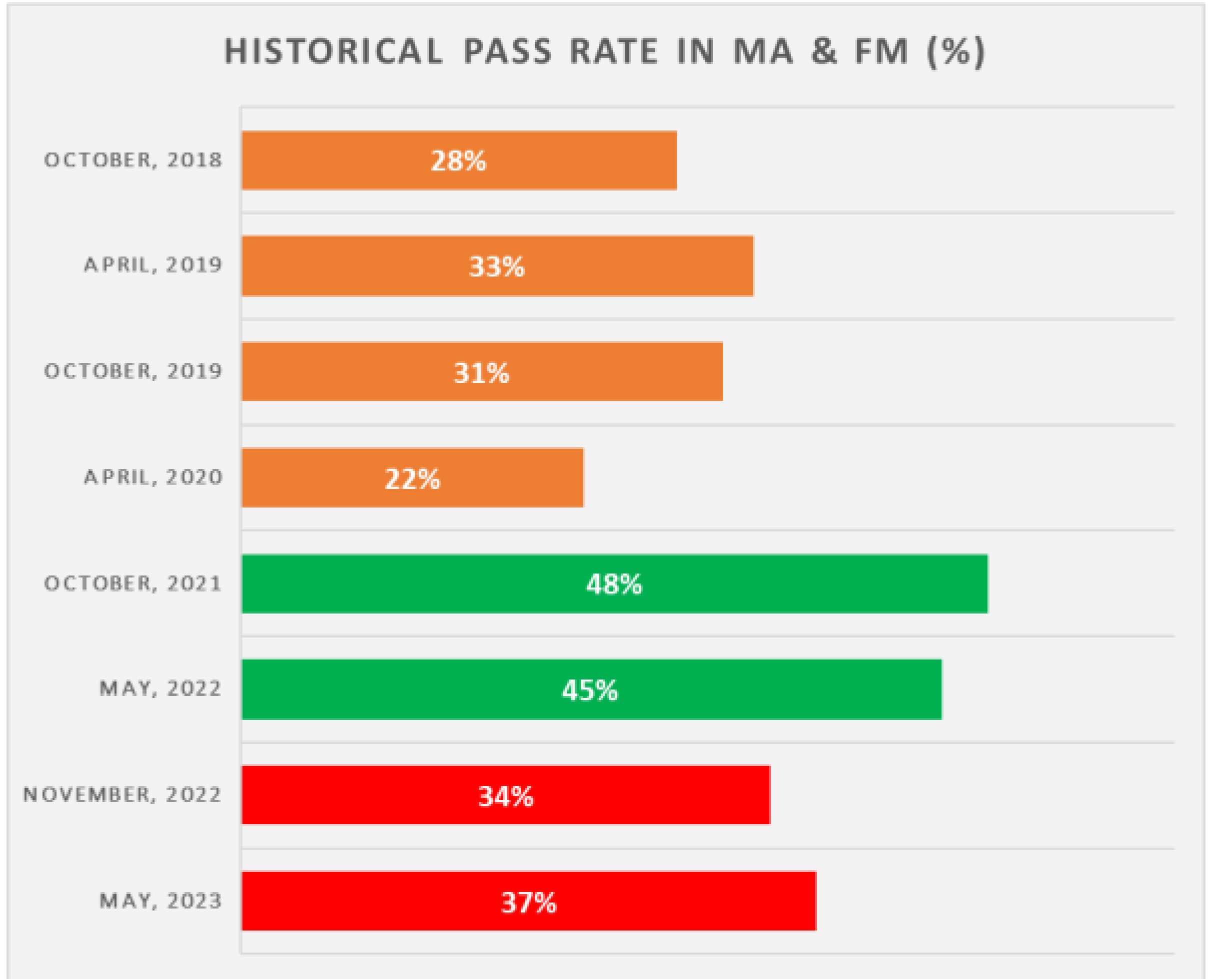
Course	Subject	Candidates	Pass Rate
201	Investment Mgt.	541	56%
202	International Trade	664	49%
203	Ethics in Banking	500	58%
204	MA & FM	663	34%
205	E-Banking	451	66%
206	MF and Rural Banking	430	74%

Statistics 1: Success Rate of Part-II Exams (May 2023)

Course	Subject	Candidates	Pass Rate
201	Investment Mgt.	393	53%
202	International Trade	510	42%
203	Ethics in Banking	389	41%
204	MA & FM	473	37%
205	E-Banking	347	49%
206	MF and Rural Banking	314	71%

Statistics 2: Historical Pass Rate of MA & FM Exam

Examination	No. of Candidates	Pass Rate (%)
May, 2023	473	37%
November, 2022	663	34%
May, 2022	683	45%
October, 2021	986	48%
April, 2020	655	22%
October, 2019	879	31%
April, 2019	517	33%
October, 2018	626	28%



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• Initiative
• Planning
• Risk Assessment & Mitigation
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Execution
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• Determination
• Confidence
• Risk Taking Attitude

Risk Management

Owner: White Star Line (UK)
Time to Complete: 3 years (1909-1912)
Cost: GBP 1.5 Million
Weight: 52,310 DWT
Port Registry: Liverpool, UK
Route: Southampton to New York City
Voyage 10 April, 1912

Passenger & Crew: 2,224
Fate: Sank on 15 April, 1912
Died: 1500
Sinking Time: 2 Hours 40 Minutes

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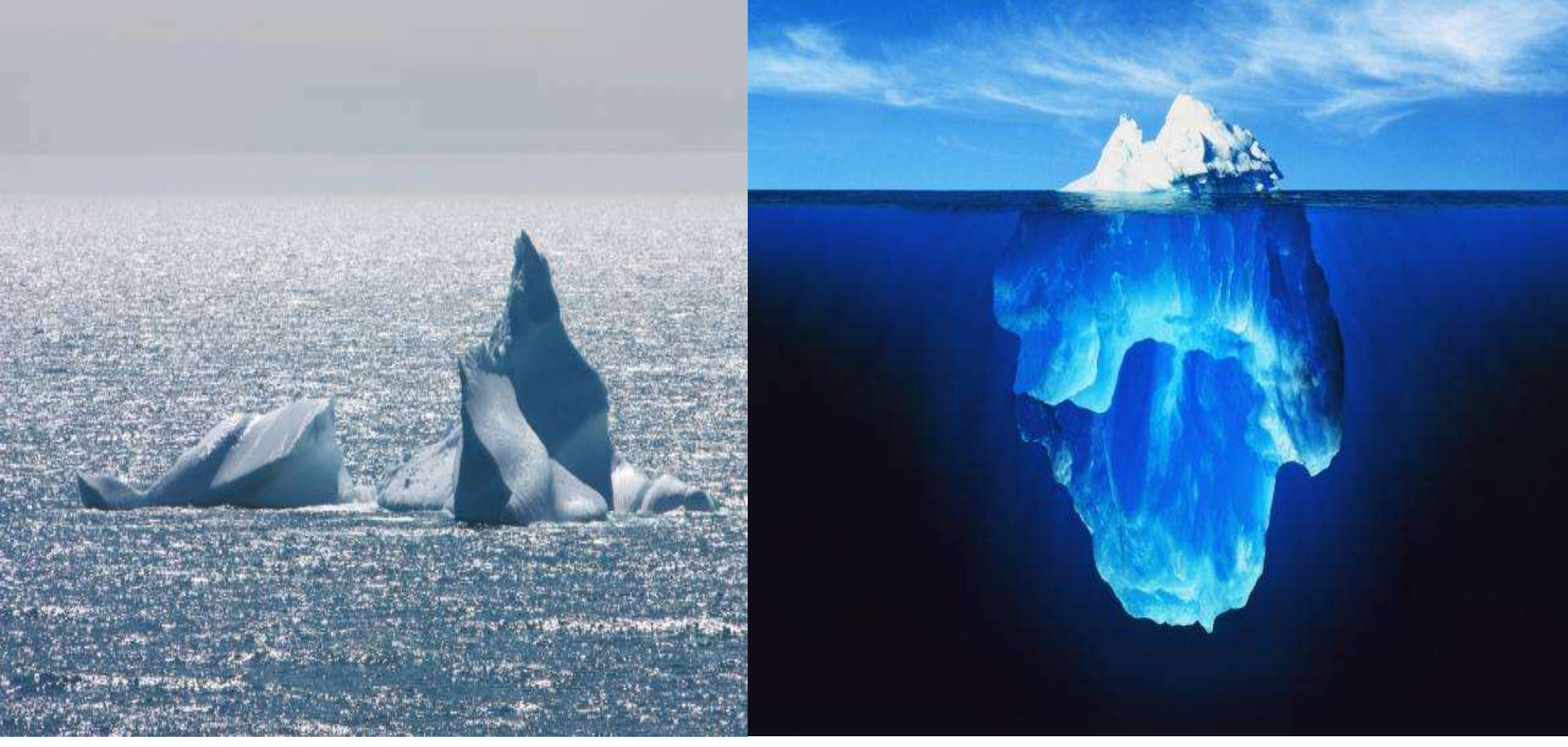

Iceberg that was visible from the Titanic

Unseen Story of the Iceberg

Summary of Course Contents

Management Accounting:

1. **Introduction:**

Management Accounting, Financial Accounting, Cost Accounting: Their Relationship and Implications

2. **Cost-Volume- Profit Analysis:**

Break even Point (BEP): Units and Amount, Margin of Safety, Implications of Increase/decrease of Variable/Fixed costs on BEP

3. **Financial Analysis and Planning:**

Sources of Financial Information- Income Statement and Balance Sheet, Statement of Changes in Financial Position- Fund Flow and Cash Flow Statement - Ratio Analysis, Financial Spread Sheet

4. **Absorption and Variable Costing:**

Absorption Costing Vs. Variable Costing: Calculations, Implications, Advantages and Disadvantages and Reconciliations

5. **Budgeting For Planning and Control:**

Basic Framework of Budgeting: Master Budget & Cash Budget, Preparation of Cash and Flexible Budget

Summary of Course Contents

Financial Management:

1. **Time Value of Money:**

Concept of Present Value, Future Value, Annuity, Perpetuity, Islamic Concept of Time Value of Money

2. **Capital Budgeting:**

Non Discounted Cash flow Techniques: Accounting Rate of Return (ARR), Pay Back Period (PPB)
Discounted Cash flow Techniques: NPV, IRR, PI, Capital Rationing and their Applications on Business

3. **Working Capital Management, Short, Medium and Long Term Finance:**

Different Financing Mix: Short Term Financing Vs. Long Term Financing

4. **Lease Financing :**

Types of Lease Financing: Operating Lease Vs. Financial Lease, HPSM and their Implications

5. **Cost of Capital and Dividend Policy:**

Components of Cost of Capital: Cost of Common Stock, Cost of Preferred Stock and Cost of Debt
Weighted Average Cost of Capital, Marginal Cost of Capital, Cost of Capital in Islam
Types of Dividend Policy, Factors influencing Dividend Policy, Rationale of High and Low Pay-Out Ratio

Exam Pattern

- There are **8 (eight) questions** having **4(four) questions** each from **Management Accounting Section** and **Financial Management Section.**
- Each Question carry **20 (twenty) marks**.
- You have to answer **5 (five) questions** at least **2 (two) questions** from each section.
- Generally, there is **a full theory type question** in Management Accounting Section which usually contains financial accounting, management accounting and cost accounting issues with implications in banking business
- There is a **short note type question** in Management Accounting Section where you have to answer 5 (five) short notes out of 8 (eight) short notes.
- Other **6(six) questions** carry **math/calculations** with very low weighateg of theory

EXAM PATTERN

Examiner’s Review & Tips

To Do:

- **Plan** for the exam. Make proper **time management**
- Give sufficient **reading and planning time** for the questions and take **note of key points**
- Start answering the questions which you are **most confident**
- Be very **precise and specific** in answering question. The examiner always wants to see the **key words** in your answer
- Follow all the **procedures in solving problems**. Give your examiner the impression that you know the solution
- Show your **calculations and workings** wherever required

Examiner’s Review & Tips

Not to Do:

- Do not enter exam hall **without preparation.** You can not try your luck!!

- **Do not start your answer with theory** which might create negative impression on the examiner

- Do not write **unnecessary and irrelevant remarks** in your answer script. You should not consider your examiner a stupid !!

- Do not **break the sequence** in answering questions. If you are unable to answer a part of a specific question, keep a space to attempt it later

- **Don’t be stuck up** in a particular problem. Leave it for a moment, attempt another question and come back to the question later

Why Understanding Basics?

- Build your confidence level
- Immensely benefit you in your day to day banking affairs
- Help in understanding problems and finding solutions
- Increase the possibility of your success rate in the exam
- Increase your professional skill (Knowledge Vs. Degree)
- Help to grow your career

MANAGEMENT
ACCOUNTING

Understanding the Basics

Management Accounting , Financial Accounting and Cost Accounting :

Management Accounting	Financial Accounting	Cost Accounting
Deals with collection of data and information, classification and analysis for helping the management to make managerial decision	Deals with preparation of Profit and Loss Account and Statement of Financial Position in a specific time interval	Deals with determination of cost of a product/services, cost control and analysis of cost/expenditure for helping management to make decision
It is related with present, past and future	It is only related with past thus it is like a postmortem report	It is a part of management accounting
There is no regulatory timeframe to prepare management accounting report	It is prepared in a regular interval and there is a regulatory requirement; like yearly, semiannually, quarterly etc.	It is prepared as and when required basis
It does not require auditing and mathematical accuracy is also not required	It requires mathematical accuracy and mandatory requirement for auditing	No such requirement of mathematical accuracy and auditing

Understanding the Basics

Costs and Cost Elements:

- Cost is the **amount of expenditure** which is **either incurred (actual)** or **notional (attributable)** relating to a specific thing or activity. Cost can be classified from different dimensions:

A. Natural Characteristics:

i. Raw Materials is the main component of production process.
Direct Raw Material- Fabric for Garments Industry, Wood for Furniture, Cotton for Spinning Industry etc.
Indirect Raw Material- Yarn, accessories for Garments Industry

ii. Labour includes both wages and salaries for workers and employees
Direct Labour- Directly related with production; like wages for workers
Indirect Labour –Not directly related with production; like salary of the factory employees

iii. Other Expenses includes costs other than raw materials and labour for conversion to finished goods
Direct Expenses-Electricity, gas, water, depreciation of machineries, maintenance relating to production
Indirect Expenses- Factory rent, depreciation of other machineries etc.

Understanding the Basics

Costs and Cost Elements:

B. Changes in the Level of Activity:

i. Fixed Cost is the cost that does not change or remain unchanged at the change (increase/decrease) of the production level. Example- Factory Rent

ii. Variable Cost is the cost that is proportionate to the change in production level. Example- Raw material

iii. Semi-Variable Cost is the cost that changes with production level at a disproportionate rate. Example-Depreciation of machineries and maintenance cost etc.

C. Nature of Function:

i. Production Cost: The costs that are directly related with production
=**Direct Material+ Direct Labour+ Direct Expenses+ Other factory overheads**

ii. Administrative Expenses: All indirect expenses relating to administration and management. Example-Salary and allowances of employees

iii. Selling & Distribution Expenses- Advertisement cost, salary/commission of selling agent/employee Freight out, Salary of distribution agent etc.

Understanding the Basics

Cost Accounting
Elements of Cost
-Material Direct?
-Labour Indirect?
-Overhead

Costs and Cost Elements: Cost Sheet

1. **Prime Cost: Costs Directly Related with Production**

(Direct Materials*+ Direct Labour+ Direct Expenses)

***Direct Materials= (a) Opening Stock Raw Materials**

(+) Purchase of Raw Materials
(-) Purchase Discounts
(-) Purchase Returns
(+) Carriage in/ Freight In

(b) Cost of Purchase

(a)+(b) = Cost of Raw Materials Available for Use
(c) (-) Closing Stock of Raw Materials

(a)+(b)-(c) = Direct Materials Consumed

Understanding the Basics

Cost Accounting
Elements of Cost
-Material Direct?
-Labour Indirect?
-Overhead

Costs and Cost Elements: Cost Sheet

2. Total Manufacturing Cost: Prime Cost + Total Factory Overheads*

   *Factory Overheads= All factory related costs that are not directly related with production

   (Indirect Materials, Indirect Labor, Factory Fuel and Power, Coal, Gas, Water, Factory Manager's Salary, Factory Rent & Taxes, Factory Lighting and Fighting, Factory Repairs, Worker's Welfare Expenses, Insurance Premium for Factory, Depreciation of Plant & Machineries)

3. Cost of Goods Manufactured = Total Manufacturing Cost
   (+) Beginning Work-in-Process (WIP) Inventory
   (-) Closing Work-in-Process (WIP) Inventory

4. Cost of Goods Sold (COGS) = Cost of Goods Manufactured
   (+) Beginning Finished Goods Inventory
   (-) Closing Finished Goods Inventory

5. Total Costs = Cost of Goods Sold+ Administrative Expenses+ Selling Expenses

Understanding the Basics

Costs and Cost Elements: Link with Income Statement

Income Statement for the Year Ended 2020

Particulars		Amount in Tk.
Sales		****
Less: Cost of Goods Sold (COGS)		(***)
Gross Profit (a)		***
Less: Administrative Expenses	***	
Less: Marketing & Selling Expenses	***	
Total Operating Expenses (b)		(***)
Net Profit from Operation/Operating Profit [(a)-(b)]		***
Add: Non Operating Income		**
Earnings before Interest and Tax (EBIT)		**
Less: Interest/Profit paid to banks/FIs		(**)
Earnings Before Tax(EBT)		**
Less: Income Tax		(**)
Net Profit After Tax		**

Understanding the Basics

Contribution Margin, BEP and Margin of Safety

Breakeven Point:
In accounting, the **breakeven point** is the production level at which total revenues equal total expenses. That is, it is a no profit, no loss situation

- **Blue dotted line** indicates fixed cost
- **Yellow dotted line** indicates variable cost
- **Orange Line** shows total cost; i.e., variable cost+ Fixed Cost
- **Green Line** shows total revenue
- The Point at which total revenue line intersects with total cost line is the breakeven point

BREAK EVEN POINT GRAPH

Y
40
20
Sales ($)
Breack-even poin
Profit
Loss
TOTAL REVENUE
TOTAL COST
VARIABLE
FIX
X
5
Units sold
8
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Understanding the Basics

Contribution Margin (C/M), BEP and Margin of Safety

C/M= (Sales-Variable Cost) or C/M Per Unit= (Sales/unit-Variable Cost/unit)
C/M Ratio= (Sales-Variable Cost)/Sales [C/M Ratio is also known as Profit Volume (P/V) Ratio]

Breakeven Sales in Tk. = Fixed Cost/Contribution Margin Ratio
Breakeven Sales in Unit = Fixed Cost/C/M Per Unit

Margin of Safety (M/S) in Tk. =Sales-EBP Sales
Margin of Safety (M/S) Ratio = Margin of Safety/Sales

Required Sales (Value) for Desired Profit = (Fixed Cost+ Desired Profit)/C/M Ratio
Required Sales (Unit) for Desired Profit = (Fixed Cost+ Desired Profit)/C/M per unit

Go Back

Understanding the Basics

Costing: Absorption Costing Vs. Marginal/Variable Costing

Absorption Costing:

Absorption costing is a method for accumulating fixed and variable costs associated with the production process and apportioning them to individual products. Thus, a product may absorb a broad range of costs.

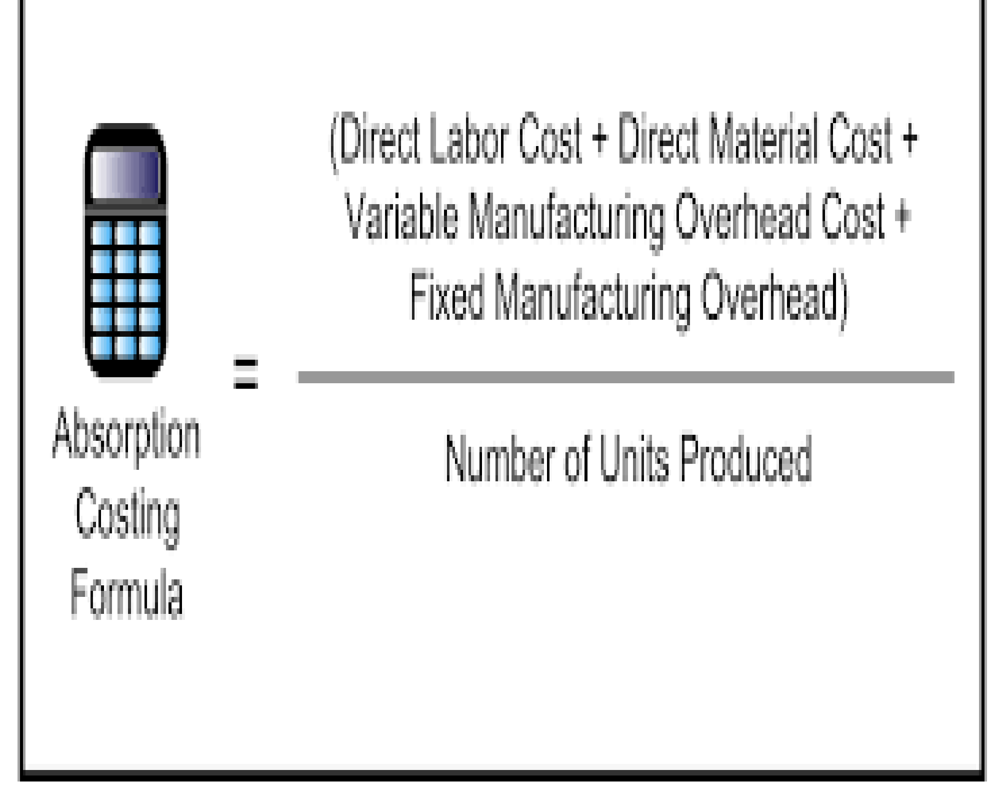
Absorption Costing Components:

Direct Materials: Those materials that are included in a finished product.

Direct Labour: The factory labor costs required to construct a product.

Variable Manufacturing Overhead: The costs to operate a manufacturing facility, which vary with production volume. Examples are supplies and electricity for production equipment.

Fixed manufacturing Overhead: The costs to operate a manufacturing facility, which do not vary with production volume. Examples are rent and insurance.



Understanding the Basics

Costing: Absorption Costing Vs. Marginal/Variable Costing

Marginal/Variable Costing:

Variable costing is a concept used in managerial and cost accounting in which the fixed manufacturing overhead is excluded from the product-cost of production. It includes only the variable costs associated with the production process.

Variable Costing Components:

Direct Materials: Those materials that are included in a finished product.

Direct Labour: The factory labor costs required to construct a product.

Variable Manufacturing Overhead: The costs to operate a manufacturing facility, which vary with production volume. Examples are supplies and electricity for production equipment.

Fixed manufacturing Overhead: Excluded from Variable Costing Method

Understanding the Basics

Absorption Costing Vs. Marginal/Variable Costing: Differences

Areas of Differences	Marginal Costing/Variable Costing	Absorption Costing
Product Costing and Inventory Valuation	For product costing & inventory valuation, only variable cost is considered	For product costing & inventory valuation, both fixed & variable costs are considered.
Implication of Fixed Cost on Profitability of Products	Fixed cost is considered as period cost & profitability of different products is judged by Profit/Volume ratio (P/V ratio)	Fixed cost is charged to cost of production. A reasonable share of fixed cost is to be borne by each product & thereby subjective apportionment of fixed overheads influences the profitability of product.
Presentation of Data	The presentation of data is so oriented that total contribution & contribution from each product gets highlighted.	The presentation of cost data is on conventional pattern. After deducting fixed overhead, the net profit of each product is determined.
Implication of Opening and Closing Stock on unit cost of Production	The unit cost of production does not get affected by the difference in the magnitude of opening stock & closing stock.	Due to the impact of the related fixed overheads, the unit cost of production get affected by the difference in the magnitude of opening stock & closing stock.

Understanding the Basics

Effects of Opening & Closing Stock on Profit: Absorption Vs. Marginal Costing

1. The results under both the **methods will be same in situations where sales & production coincide** i.e., there is neither opening stock nor closing stock.

2. **Profit under absorption costing will be more than the profit under marginal costing, when closing stock is more than the opening stock (Example with Calculation in the Next Slide).** The reason behind this is that, under absorption costing, a portion of fixed overhead, instead of being charged to the current period, is charged to the closing stock & carried over to the next period.

3. **Profit shown under absorption costing will be lower than the profit shown under marginal costing, when closing stock is less than the opening stock.** The reason behind this is that, under absorption costing, to the current period, a portion of fixed cost related to previous year is charged.

Understanding the Basics

Effects on Profit: Absorption Vs. Marginal/Variable Costing

ABSORPTION COSTING			
Particulars	Qty	Per Unit	Amt ($)
Revenue	600	100.00	60,000
Less: Cost of Goods Sold:			
Add Beginning Inventory	-	-	
Variable Manufacturing Costs	900	20.00	18,000
Allocated Fixed Manufacturing Costs	900	20.00	18,000
($18000/9000 Units of Production = 20)			
Cost of Goods Available for Sale		40.00	36,000
Deduct Ending Inventory	300	40.00	(12,000)
Cost of Goods Sold	600	40.00	24,000
Gross Margin	600	60.00	36,000
Variable Marketing Costs	600	16.50	9,900
Fixed Marketing Costs	600	23.33	14,000
Operating Income			12,100

VARIABLE COSTING				Reconcile
Particulars	Qty	Per Unit	Amt ($)	
Revenue	600	100.00	60,000	-
Less: Variable Cost of Goods Sold:				
Add Beginning Inventory	-	-		
Variable Manufacturing Costs	900	20.00	18,000	-
			-	18,000
Cost of Goods Available for Sale		20.00	18,000	
Deduct Ending Inventory	300	20.00	(6,000)	(6,000)
Variable Cost of Goods Sold	600	20.00	12,000	
Variable Marketing Costs	600	16.50	9,900	(9,900)
Contribution Margin	600	63.50	38,100	
				9,900
Fixed Marketing Costs	600	23.33	14,000	
Fixed Manufacturing Costs			18,000	(18,000)
Operating Income			6,100	6,000

Understanding the Basics

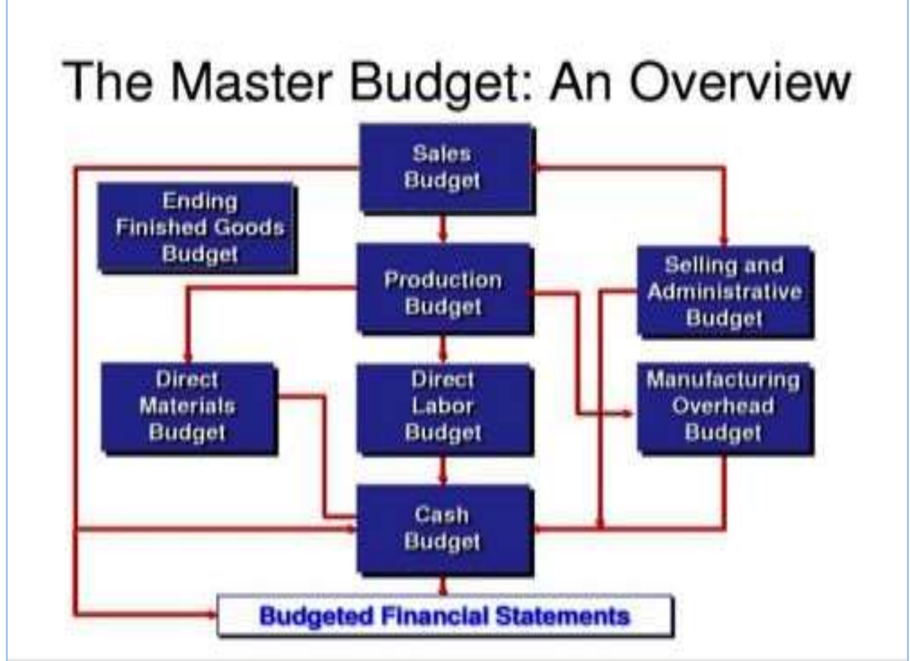
Budget: Master, Fixed, Flexible Budget and Cash Budget

Budget:

A budget is a financial plan for a defined period, often for one year. It may also include planned sales volumes and revenues, resource quantities, costs and expenses, assets, liabilities and cash flow

What is a Master Budget?

The master budget is the aggregation of all lower-level budgets produced by a company's various functional areas, and also includes budgeted financial statements, a cash forecast, and a financing plan.



Fixed Budget Vs. Flexible Budget:

A fixed budget is a budget that doesn't change due to any change in activity level or output level. The fixed budget is static and doesn't change at all.

The flexible budget is **a budget that changes as per the activity level or production of units**.

Understanding the Basics

Budget: Master, Fixed, Flexible Budget and Cash Budget

Cash Budget:

A cash budget is **an estimation of the cash inflows and outflows of a business over a specific period of time**. This could be for a weekly, monthly, quarterly, or annual budget. This budget is used to assess whether the entity has sufficient cash to continue operating over the given time frame.

Importance of Cash Budget:

- It allows a company to establish **the amount of credit that it can extend to customers without having problems with liquidity**.
- A cash budget helps avoid a shortage of cash during periods in which a company encounters a high number of expenses.

Components of Cash Budget:

The cash budget represents a detailed plan of future cash flows and is composed of **four elements:**

1. **Cash Receipts** (Cash Sales, Collection of Receivables, Other Income)
2. **Cash Payments** (Raw Materials, Payroll, Other Direct Expenses, Administrative and Selling Expenses, Plant and Equipment and other payments
3. **Net Change in Cash for the Period and**
4. **New Financing Needed**

Understanding the Basics

Financial Statement Analysis

- **Financial Statement Analysis:**

- Financial statement analysis is the process of analyzing a company's financial statements for decision-making purposes.

- **External stakeholders** use it to understand the overall health of an organization as well as to evaluate financial performance and business value.

- **Internal users** use it as a monitoring tool for managing the finances as well as internal decision making.

- **Techniques Used for Financial Statement Analysis:**
  1. **Horizontal Analysis** (Compares data horizontally, by analyzing values of line items across two or more years)
  2. **Vertical Analysis** (Vertical analysis looks at the vertical affects line items have on other parts of the business and also the business's proportions)
  3. **Ratio Analysis** (Ratio analysis uses important ratio metrics to calculate statistical relationships)

- **Components of Financial Statements:**

  1. Balance Sheet 2. Profit & Loss Statement 3. Cash flow Statement

Understanding the Basics

Financial Statement Analysis

What is Ratio Analysis?

Ratio analysis is a quantitative method of gaining insight into a company's liquidity, operational efficiency, solvency and profitability by studying its financial statements such as the balance sheet and income statement.

Comparisons of Ratio Analysis:

1. **Internal Comparison:** The analyst can compare a present ratio with past and expected future ratio for the same company. When financial ratios are arrayed over a period of years, the analyst can study the composition of change and determine whether there has been an improvement or deterioration in the firm's financial condition and performance over time.

2. **External Comparisons and Sources of Industry Ratio:** External comparison involves comparing the ratio of one firm with those of similar firms (peer) or with industry averages at the same point in time. Such a comparison gives insight into the relative financial condition and performance of the firm. It also helps us identify any significant deviations from any applicable industry average/peer average

Understanding the Basics

Financial Statement Analysis

Dimensions of Ratio Analysis:

Ratio Analysis Types

- Profitability Ratios
  - Gross Profit Ratios
  - Net Profit Ratios
  - Operating Profit Ratios
  - Return on Capital Employed
- Solvency Ratios
  - Debt Equity Ratio
  - Interest Coverage Ratio
- Liquidity Ratios
  - Current Ratio
  - Quick Ratio
- Turnover Ratios
  - Fixed Asset Turnover Ratio
  - Inventory Turnover Ratio
  - Receivable Turnover Ratio
- Earning Ratios
  - P/E Ratio
  - Earnings Per Share
  - Return on Net Worth

WallStreetMojo

Financial Statement Analysis

Dimensions of Ratio Analysis: Profitability

Profitability ratios measure a company's ability to generate income relative to revenue, balance sheet assets, operating costs, and equity.

Ratio	Formula	Desired	Interpretation
Gross Profit Margin (%)	Gross Profit / Net Sales	↑	Show how much profit a company makes from its net sales after paying its cost of goods sold
Operating Profit Margin (%)	Operating Profit/ Net sales	↑	Compares the operating income of a company to its net sales to determine operating efficiency
Net Profit Margin (%)	Net Profit/ Net Sales	↑	Compares net profit of the company to its net sales to determine the bottom line performance
Return of Assets (ROA) (%)	Net Profit/ Total Assets	↑	Measures how efficiently a company is using its assets to generate profit
Return on Equity (ROE) (%)	Net Profit/ Shareholders' Equity	↑	Measures how efficiently a company is using its equity to generate profit

Industry Average (NPM)

Industry	Net Profit Margin (%)
Spinning	5-7
Weaving	4-6
Composite Knitting	5-6
Woven Garments	4-6
Sweater	5-6
Home Textile	4-6
Cement	5-6
Real Estate- Construction	11-13
Jute Spinning	3-5
Pharmaceutical- Medicine	7-8
Steel Re-rolling	3-4
Power Generation	25-30

Financial Statement Analysis

Dimensions of Ratio Analysis: Liquidity

Liquidity ratios are financial ratios that measure a company's ability to repay short-term obligations. It indicates the short-term solvency of the company.

Ratio	Formula	Desired	Interpretation
Current Ratio (Times)	Current assets / Current liabilities	↑	Measures a company's ability to pay off short-term liabilities/obligations with current assets
Quick Ratio (Times)	(Current assets – Inventories) / Current liabilities	↑	Measures a company's ability to pay off short-term liabilities/obligations with quick assets
Cash Ratio (Times)	Cash and Cash equivalents / Current Liabilities	↑	Measures a company's ability to pay off short-term liabilities/obligations with cash and cash equivalents

Financial Statement Analysis

Dimensions of Ratio Analysis: Solvency

Solvency ratios are financial ratios that measure a company's ability to survive in the long run. It measures the company's leverage structure and it's debt payment capacity

Ratio	Formula	Desired	Interpretation
Debt to Equity (Times)	Total Debt/ Shareholders Equity	↓	Assess the extent to which the firm is using borrowed money or external financing
Debt to Total Assets (%)	Total Debt/ Total Assets	↓	Relative importance of debt financing to the firm by showing the percentage of the firm's assets that is supported by debt financing.
Interest (Finance Cost) Coverage Ratio (Times)	Earnings Before Interest & Tax(EBIT)/Interest Expenses or Finance Cost	↑	Measure the firm's ability to meet its interest payments and thus avoid bankruptcy
Debt Service Coverage Ratio (Times)	Operating Profit/Total Debt Service	↑	Measure the firm's ability to meet its financial obligations from it operating profit

Industry Average (LR)

Industry	Leverage ratio (X)
Spinning	1.50-2.00
Weaving	1.60-1.75
Composite Knitting	1.75-2.00
Woven Garments	1.50-1.70
Sweater	0.75-1.00
Home Textile	1.75-2.00
Cement	1.00-1.50
Real Estate- Construction	3.50-3.75
Jute Spinning	1.00-1.50
Pharmaceutical- Medicine	0.75-1.00
Pharmaceutical- Infusion	2.50-2.75
Steel Re-rolling	2.50-2.75
Power Generation	1.00-1.25

Financial Statement Analysis

Dimensions of Ratio Analysis: Efficiency/Turnover Ratio

Efficiency ratios, also known as activity financial ratios, are used to measure how well a company is utilizing its assets and resources.

Ratio	Formula	Interpretation	Desired
Receivable Turnover (Times) **Average Collection Period (Days)**	Annual Net Credit Sales/Receivable (Receivables * No of Days in a Year)/Annual Net Credit Sales	Provides insight into the quality of the firm's receivables and how successful the firm is in its collections.	↑ ↓
Inventory Turnover (Times) **Inventory Turnover in Days**	Cost of Goods Sold/Inventory (Inventory * No of Days in a year)/Cost of Goods sold	Determine how effectively the firm is managing inventory	↑ ↓
Operating Cycle **Cash Cycle**	Receivable Turnover in Days+ Inventory Turnover in Days Receivable Turnover in Days+ Inventory Turnover in Days- Payable Turnover in days		↓

Understanding the Basics

Financial Statement Analysis

Dimensions of Ratio Analysis: Earnings/Market Value Ratio

Market value ratios are used to evaluate the share price of a company's stock.

Ratio	Formula	Interpretation
Dividend Yield Ratio (%)	Dividend per share / Share price	The dividend yield ratio measures the amount of dividends attributed to shareholders relative to the market value per share
Earnings per Share Ratio (Tk.)	Net Profit After Tax/ No of Shares Outstanding	The earnings per share ratio measures the amount of net income earned for each share outstanding
Price-Earnings Ratio (Times)	Share Price / Earnings Per Share	The price-earnings ratio compares a company's share price to its earnings per share

Identification of Problem is the Half of Solution

Problems & Solutions

1. Following data are collected from the record of a manufacturing concern:

Particulars	**Amount in Tk.**
Raw material used	25,000
Work in Process (01.06.2019)	40,000
Work in Process (30.06.2019)	60,000
Finished Goods (01.06.2019)	150,000
Finished Goods (30.06.2019)	75,000
Direct Wages	1,300 Hours @ Tk.30 per Hour
Direct Expenses	82,000
Factory Indirect Material	52,000
Factory Labour	80,000
Administrative Expense:	
Fixed	50,000
Variable	10% of Prime Cost
Selling Expenses:	
Fixed	30,000
Variable	5% of Cost of Goods Manufactured
Profit	**10% on Sales**

Requirements?

1. Prime Cost
2. Factory Production Cost,
3. Cost of Goods Manufactured,
4. Cost of Goods Sold
5. Total Cost
6. Sales

Ref	Calculation of Cost		Amount in Tk.
1	Raw Material used		25,000
2	Direct Wages	(1300*30)	39,000
3	Direct Expenses		82,000
4	A. Prime cost (1+2+3)		146,000
5	**Factory Overheads**		
6	Indirect Material		52,000
7	Factory Labour		80,000
8	**Total Factory Overheads (6+7)**		**132,000**
9	B. Total Manufacturing Cost (4+8)		278,000
10	+WIP (BB)		40,000
11	-WIP (CB)		60,000
12	C. Cost of Goods Manufactured (9+10-11)		258,000
13	+Finished Goods(BB)		150,000
14	-Finished Goods (CB)		75,000
15	D. Cost of Goods Sold (12+13-14)		333,000
16	Fixed Administrative Expenses	50,000	
17	Variable (10% of Prime Cost)	14,600	
18	**Total Administrative Expenses (16+17)**		**64,600**
19	Fixed Selling Expenses	30,000	
20	Variable (5% of COGM)	12,900	
21	**Total Selling Expenses (19+20)**		**42,900**
22	E. Total Cost (15+18+21)		440,500
23	F. Sales [Total Cost/(1-Profit Rate]		489,444

Particulars	Amount in Tk.
Raw material used	25,000
Work in Process (01.06.2019)	40,000
Work in Process (30.06.2019)	60,000
Finished Goods (01.06.2019)	150,000
Finished Goods (30.06.2019)	75,000
Direct Wages	1,300 Hours @ Tk.30 per Hour
Direct Expenses	82,000
Factory Indirect Material	52,000
Factory Labour	80,000
Administrative Expense:	
Fixed	50,000
Variable	10% of Prime Cost
Selling Expenses:	
Fixed	30,000
Variable	5% of Cost of Goods Manufactured
Profit	**10% on Sales**

Problems & Solutions

2. a) What do the liquidity ratios indicate? Why acid-test ratio is considered as a better indicator of liquidity?

   b) Selected financial ratios for XYZ Company and the industry average are as follows:

Ratios	Firm	Industry
Current ratio	3.2x	2.5x
Acid-test ratio	1.75x	1.9x
Debt to assets	23%	33%
Inventory turnover	5.5x	8.7x
Average collection period	33 days	40 days
Net profit margin	3.80%	3.50%
Return on investment	11.50%	9.75%

Requirements:

1. **Evaluate the overall health of the firm compared to industry under different broad dimensions (Liquidity, Solvency, Activity and Profitability) of financial statement analysis.**
2. **What other information do you require to make a comprehensive analysis?**

2 (b) (1)

Indicators	Firm	Industry	Remarks
A. Liquidity Dimension:	Assesses the ability to repay short-term obligations		
1. Current Ratio	3.20x	2.5x	Company's position is better than the industry indicating higher capacity to meet short term obligations
2. Acid Test Ratio	1.75x	1.9x	It indicates that the firm maintains higher inventory than industry which might put pressure on cash mgt.
B. Solvency Dimension:	Measure the ability to survive in the long-run by analyzing capital structure and debt repayment capacity		
1. Debt to Assets Ratio	23%	33%	Leverage structure is better indicating relatively less reliance on external financing/borrowing
C. Activity Dimension:	Measure how well a company is utilizing its assets and resources		
1. Inventory Turnover	5.5x	8.7x	It indicates that the company maintains huge inventories
2. Average Collection Period	33 days	40 days	It indicates better receivable mgt. compared to industry
D. Profitability Dimension:	Ability to generate income relative to revenue, BS assets, operating costs and equity		
1. Net Profit Margin	3.80%	3.50%	Overall profitability dimension is good compared to industry. This might be due to less reliance on external borrowing (low finance cost), Operational efficiency etc.
2. Return on Investment	11.50%	9.75%	

2 (b) (2)

- Due to **insufficiency of data,** a good number of analysis could not be carried out.
- If we could calculate the **gross profit margin** and **operating profit margin** along with the peer/industry data, we would be able to identify the profitability strength of the company;
- Although, we have given debt to total assets ratio, it gives a **partial view of the leverage structure** of the firm. In order to get a complete structure, we need to calculate **interest /finance cost service coverage** ratio as well as **debt service coverage ratio**
- Some other activity ratio could be analyzed like, **operating cycle, cash cycle** etc. to get a complete idea about **tied up period in working capital cycle**.
- It is not clear whether the company is a listed one; if so, it is required to get earning ratio/market ratio which may include, but not limited to, **dividend yield ratio, price-earning ratio, earning per share** etc. to learn about the market perception.

This is not exhaustive list. You can add more points

Problems & Solutions

3. a) How do the following reflect in break-even volume and P/V (or C/M) ratio?

1. Increase in Fixed Cost;
2. Increase in Sales;
3. Decrease in Variable Cost per Unit;
4. Expansion of Factory Building;
5. Decrease in Selling Price per Unit

Particulars	Effects on Break-even Volume	Effects on P/V Ratio
Increase in Fixed Cost	BE Volume=Fixed Cost/CM per Unit Therefore, BE Volume will increase	P/V Ratio=Sales-VC No effect on P/V Ratio
Increase in Sales	No effect	No effect on P/V Ratio
Decrease in Variable Cost/unit	Increase the C/M; Therefore, BE Volume reduces	Increase in P/V Ratio
Expansion of Factory Building	Increase fixed cost, Thus increase BE Volume	No effect on P/V Ratio
Decrease in Selling Price/Unit	Decrease the C/M Therefore, BE Volume increases	Decreases in P/V Ratio

Problems & Solutions

3. (b) XYZ Company sells product 'X' at Tk.500 per unit. The variable cost per unit is Tk.200 while fixed cost is Tk.110,000 per month. Based on the above information, calculate the following:

1. Calculate the break-even point of sales units for a month;
2. Calculate the profit/(loss) for a month if 500 units are sold;
3. Calculate the sales revenue to earn a profit of Tk.5,000;
4. Calculate the Margin of Safety if 400 units are sold;
5. Calculate the break-even point of sales if the selling price is increased by 10%

Slide-29

3 (b)

1. Break-even Point Sales (Unit)

CM Per Unit=(Sales Per Unit-VC Per Unit)

= Tk.(500-200)=Tk.300

Break-even Point Sales (Unit)=Fixed Cost/CM Per Unit)

(110,000/300) Units=**366.67 Units or 367 Units**

2. Profit/Loss if 500 Units are sold

Profit=Sales- Variable Cost- Fixed Cost

=Tk. (500*500)-(500*200)-110,000

=TK.40,000

3. Sales Revenue to Earn Profit of Tk. 5,000

=(Fixed Cost +Desired Profit)/CM Ratio

CM Ratio= (Sales-VC)/Sales

=(500-200)/500

=0.60

Therefore, Sales Revenue to Earn Profit of Tk. 5,000

=(110,000+5000)/0.60

= **Tk. 191,667**

4. Margin of Safety= Sales-Break-even Sales

(400*500)-(367*500) =Tk. 16,500

5. Break Even Sales if Selling Price is increased by 10%

Selling Price at 10% increase=TK.550

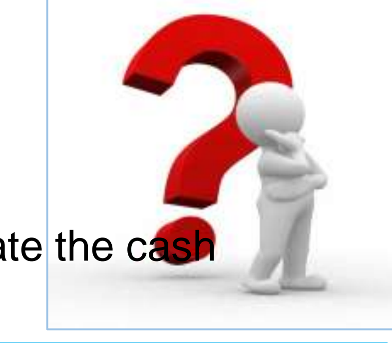
Revised Contribution Margin=(550-200)=Tk.350

CM Ratio=350/550= 0.64

Break-even Sales (Volume)=Fixed Cost/CM Ratio

=110,000/0.64= **Tk.171,875**

Problems & Solutions



4. You have been assigned with the responsibility to prepare a cash budget for XYZ Company to evaluate the cash requirements. The following data are available:

Months	Sales	Raw Materials	Wages	Overheads
January, 2021	100,000	50,000	10,000	22,000
February, 2021	110,000	60,000	11,000	22,000
March, 2021	120,000	70,000	12,000	25,000
April, 2021	130,000	80,000	13,000	28,000
May, 2021	140,000	90,000	14,000	30,000
June, 2021	150,000	100,000	15,000	33,000

Credit Terms:

- Period of credit allowed by material supplier-2 months
- Lag in payments of overheads- 1 month
- No Lag in payment of wages

Other Information:

- Plant to be installed in January at a cost of Tk.50,000 and will be paid on monthly @ Tk.10,000 from 01 February, 2021.
- Extensions to research department at a cost of Tk.10,000 will be completed on March and payment to be made in April.
- Quarterly Depreciation of Plant shall be charged for Tk. 5000 in June, 2021
- Cash sales is estimated at 50% of total sales. 20% of credit sales will be received in the month following sale and 20% of credit sale in the next month while rest 10% will not be recoverable.
- Payment of Tk. 10,000 is to be made under a hire purchase contract throughout the budgeted period
- Dividend from investment of Tk.50,000 is expected to be received in June, 2021
- Tax of Tk.100,000 is due on 30 June 2021
- Cash Balance on 01 April is Tk. 100,000

Requirement: Prepare a month-wise cash budget for quarter ended June, 2021

Ref	Cash Budget April-June 2021				
	Particulars	**Apr-21**	**May-21**	**Jun-21**	**Total**
1	Cash in Hand (OB)	100,000	83,000	71,000	100,000
2=3+4+5	**Sales**	**111,000**	**120,000**	**129,000**	**360,000**
3	50% Current Month	65,000	70,000	75,000	
4	20% Previous Month	24,000	26,000	28,000	
5	20% Before Previous Month	22,000	24,000	26,000	
6	**Expenses:**				
7	Raw Material (2 Months Credit)	60,000	70,000	80,000	210,000
8	Wages (No Lag in Payment)	13,000	14,000	15,000	36,000
9	Overheads (1 Month Lag in Payment)	25,000	28,000	30,000	83,000
10	Plant	10,000	10,000	10,000	30,000
11	Research Expenditure	10,000			10,000
12	Hire Purchase	10,000	10,000	10,000	30,000
13	Payment of Tax			100,000	100,000
14	Dividend Income			50,000	50,000
15=2+14	**Total Cash Inflow**	**111,000**	**120,000**	**179,000**	**410,000**
16=7 to13	**Total Cash outflow**	**128,000**	**132,000**	**245,000**	**505,000**
17=1+15-16	**Cash in Hand (OB+ Inflow-Outflow)**	**83,000**	**71,000**	**5,000**	**5,000**

Credit Terms:
- Period of credit allowed by supplier-2 months
- Lag in payments of overheads- 1 month
- No Lag in payment of wages

Month	Sales	Raw Material	Wages	Overhead
January, 2021	100,000	50,000	10,000	22,000
February, 2021	110,000	60,000	11,000	22,000
March, 2021	120,000	70,000	12,000	25,000
April, 2021	130,000	80,000	13,000	28,000
May, 2021	140,000	90,000	14,000	30,000
June, 2021	150,000	100,000	15,000	33,000

Problems & Solutions

5. Daffodil company produces and sells a single product line, Wooden Toy Box, Selected cost and operating data relating to the products are given below:

Selling Price per Unit	50.00
Manufacturing Costs:	
Variable cost per unit produced:	
Direct materials	11.00
Direct labor	6.00
Variable overhead	3.00
Fixed Cost per year	120,000.00
Selling and Administrative costs:	
Variable per unit sold	5.00
Fixed per year	70,000.00

Units Details	**Year 1**	**Year 2**
Beginning inventory	-	2,000
Product produced during the year	10,000	6,000
Product sold during the year	8,000	8,000
Ending inventory	2,000	-

Requirements:

1. Compute an Income Statement for each year assuming that the company uses absorption costing
2. Compute an Income Statement for each year assuming that company is uses direct costing
3. Reconcile the direct costing and absorption costing net income figure

5 (1)

Income Statement: Using Absorption Costing

Particulars		Year 1		Year 2
Sales (8000 Units * Tk.50)		**400,000**		**400,000**
Cost of Goods Sold:				
Beginning Inventory	-		64,000	
+Cost of goods manufactured (10,000*20) [Y1] (6000*20)[Y2]	200,000		120,000	
+Fixed cost per year	120,000		120,000	
Cost of Goods Available for Sale	320,000		304,000	
-Ending Inventory	64,000		-	
Cost of Goods Sold		**256,000**		**304,000**
Gross Profit (Sales- COGS)		144,000		96,000
Less: Selling and administrative Costs				
Variable Sales and Admin (8000*5)	40,000		40,000	
Fixed cost per year	70,000		70,000	
		110,000		110,000
Net Profit		**34,000**		**(14,000)**

Selling Price per Unit	50.00
Manufacturing Costs:	
Variable cost per unit produced:	
Direct materials	11.00
Direct labor	6.00
Variable overhead	3.00
Fixed Cost per year	120,000.00
Selling and Administrative costs:	
Variable per unit sold	5.00
Fixed per year	70,000.00

Units Details	Year 1	Year 2
Beginning inventory	-	2,000
Product produced during the year	10,000	6,000
Product sold during the year	8,000	8,000
Ending inventory	2,000	-

Ending inventory Calculation:

Variable Cost =2,000*20=40,000

Proportionate fixed cost/unit= 120,000/10,000=12; Fixed Cost= 2,000*12=24,000

Ending Inventory= (2,000*20)+(2,000*12)=40,000+24,000=64,000

5 (2)

Income Statement: Using Direct/Variable Costing				
Particulars		**Year 1**		**Year 2**
Sales (8000 Units * Tk.50)		**400,000**		**400,000**
Variable Expenses				
Beginning Inventory	-		40,000	
Cost of goods manufactured (10,000*20)[Y1] (6000*20)[Y2]	200,000		120,000	
(-)Ending Inventory (2,000*20)	(40,000)		-	
Cost of Goods Sold		**160,000**		**160,000**
Contribution Margin		**240,000**		**240,000**
(+)Variable Sales and Administrative (8,000*5)		40,000		40,000
Fixed Expenses:				
Fixed overhead cost	120,000		120,000	
Fixed Selling and admin Costs	70,000		70,000	
		190,000		190,000
Net Profit		**10,000**		**10,000**

Selling Price per Unit	50.00
Manufacturing Costs:	
Variable cost per unit produced:	
Direct materials	11.00
Direct labor	6.00
Variable overhead	3.00
Fixed Cost per year	120,000.00
Selling and Administrative costs:	
Variable per unit sold	5.00
Fixed per year	70,000.00

Units Details	**Year 1**	**Year 2**
Beginning inventory	-	2,000
Product produced during the year	10,000	6,000
Product sold during the year	8,000	8,000
Ending inventory	2,000	-

5 (3)

Reconciliation	Year 1	Year 2
Net Profit under Direct Costing	10,000	10,000
+Ending Inventory (64,000-40,000)	24,000	-
- Beginning Inventory	-	24,000
Income under Absorption Costing	34,000	(14,000)

Selling Price per Unit	50.00
Manufacturing Costs:	
Variable cost per unit produced:	
Direct materials	11.00
Direct labor	6.00
Variable overhead	3.00
Fixed Cost per year	120,000.00
Selling and Administrative costs:	
Variable per unit sold	5.00
Fixed per year	70,000.00

Units Details	Year 1	Year 2
Beginning inventory	-	2,000
Product produced during the year	10,000	6,000
Product sold during the year	8,000	8,000
Ending inventory	2,000	-

Q&A

Thank You!

to all!

COACHING CLASS ON

Management Accounting & Financial Management

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FINANCIAL MANAGEMENT

Summary of Course Contents

Financial Management:

1. **Time Value of Money:**

Concept of Present Value, Future Value, Annuity, Perpetuity, Islamic Concept of Time Value of Money

2. **Capital Budgeting:**

Non Discounted Cash flow Techniques: Accounting Rate of Return (ARR), Pay Back Period (PPB)
Discounted Cash flow Techniques: NPV, IRR, PI, Capital Rationing and their Applications on Business

3. **Working Capital Management, Short, Medium and Long Term Finance:**

Different Financing Mix: Short Term Financing Vs. Long Term Financing

4. **Lease Financing :**

Types of Lease Financing: Operating Lease Vs. Financial Lease, HPSM and their Implications

5. **Cost of Capital and Dividend Policy:**

Components of Cost of Capital: Cost of Common Stock, Cost of Preferred Stock and Cost of Debt
Weighted Average Cost of Capital, Marginal Cost of Capital, Cost of Capital in Islam
Types of Dividend Policy, Factors influencing Dividend Policy, Rationale of High and Low Pay-Out Ratio

Understanding the Basics

Time Preference Theory:

Which would you prefer- Tk. 1000 today or Tk.1000 after one year from now?

Common sense tells us to take the Tk.1000 today because we recognize that there is a *time value of money*. The concept of preference is known to as **"Time Preference Theory".**

1. **Consumption:** Human being, by nature, prefers current consumption to future consumption. If he/she is refrained from current consumption, he/she will obviously require some compensation.
2. **Uncertainty:** Uncertainty is another argument behind the time preference theory. Future is always uncertain. If we allow for uncertainty surrounding cash flows to enter into our analysis, it will be necessary to add a risk premium as compensation for uncertainty.
3. **Investment opportunity:** Investment opportunity should also be taken into consideration because there is an opportunity cost of money.
4. **Inflation:** This is the most important argument behind the time preference theory. The purchasing power of people reduces in the passage of time due to inflation. You cannot purchase as many goods after one year with Tk.1000 as you can purchase today with the same amount of money.

Understanding the Basics

Time Value of Money: Key Concepts

The Interest/Profit Rate: Money paid or earned for the use of money is called interest. Another to say, it is the cost of using money. That is, it is the additional amount of money gained between the beginning and the end of a time period.

Future Value (Terminal Value): The value at some future time of a present amount of money, or a series of payments, evaluated at a given interest/profit rate. This future value will include both the principal amount and the interest/ profit amount.

Present Value: is the value of an expected income stream determined as of the date of valuation. The present value is usually less than the future value because money has interest/profit-earning potential

Compounding: Compounding is the process whereby interest/profit is credited to an existing principal amount as well as to interest/profit already paid.

Understanding the Basics

Time Value of Money: Key Concepts

Present Value to Future Value:

$FV_n = PV_0 (1+i)^n$……………………. (1)

Where,

FV_n= Future value after n period.

PV_0= Present value or initial investment.

i= Interest/Profit rate.

n= Number of years.

Example: At the end of ten years, how much is an initial deposit of Tk.100 worth, assuming a compound annual interest rate 8%?

Solution:

We know,

$$FV_n = PV_0 (1+i)^n$$

$$FV_{10} = 100 (1+.08)^{10}$$

$= 100(2.1589)$ [Take at least four digit after points at the time of using formula]

$=$ Tk. 215.89

So you will have an amount of Tk.215.89 at the end of ten years if you get a compound interest rate of 8% compounded yearly.

Understanding the Basics

Time Value of Money: Key Concepts

Instead of using the formula, you can use **table value** to solve the problem.

$$FV_n = PV_0\ (FVIF_{i,\ n})$$

Let us solve the above problem through using the table value.

$FV_n = PV_0\ (FVIF_{i,\ n})$

$FV_{10} = 100\ (FVIF_{8\%,\ 10\ years})$

$= 100(2.159)$ [Using the table value]

$=$ Tk.215.90

*** FVIF=Future Value Interest Factor**

Future value interest factors of a mixed stream cash flow

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	1.010	1.020	1.030	1.040	1.050	1.060	1.070	1.080	1.090	1.100
2	1.020	1.040	1.061	1.082	1.103	1.124	1.145	1.166	1.188	1.210
3	1.030	1.061	1.093	1.125	1.158	1.191	1.225	1.260	1.295	1.311
4	1.041	1.082	1.126	1.170	1.216	1.262	1.311	1.360	1.412	1.464
5	1.051	1.104	1.159	1.217	1.276	1.338	1.403	1.469	1.539	1.611
6	1.062	1.126	1.194	1.265	1.340	1.419	1.501	1.587	1.677	1.772
7	1.072	1.149	1.230	1.316	1.407	1.504	1.606	1.714	1.828	1.949
8	1.083	1.172	1.267	1.369	1.477	1.594	1.718	1.851	1.993	2.144
9	1.094	1.195	1.305	1.423	1.551	1.689	1.838	1.999	2.172	2.358
10	1.105	1.219	1.344	1.480	1.629	1.791	1.967	2.159	2.167	2.594
11	1.116	1.243	1.384	1.539	1.710	1.898	2.105	2.332	2.580	2.853
12	1.127	1.268	1.426	1.601	1.796	2.012	2.252	2.518	2.813	3.138
13	1.138	1.294	1.469	1.665	1.886	2.133	2.410	2.720	3.066	3.452
14	1.149	1.319	1.513	1.732	1.980	2.261	2.579	2.937	3.342	3.797
15	1.161	1.346	1.558	1.801	2.079	2.397	2.759	3.172	3.642	4.177

Understanding the Basics

Time Value of Money: Key Concepts

Future Value to Present Value:

We Know from formula(1), $FV_n = PV_0 (1+i)^n$

Rearranging the term, we can solve it for present value-

$$PV_0 = FV_n [1/(1+i)^n] \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

So we can find out the present value of Tk.2000 after 10 years at 8% discount rate.

$$PV_0 = FV_n [1/(1+i)^n]$$
$$PV_0 = 2000 [1/(1+.08)^{10}]$$
$$PV_0 = 2000 [1/(1+i)^n]$$
$$= 2000(0.4631)$$
$$= Tk.926$$

We can also solve the problem by using table value:

$$PV_0 = FV_{10} (PVIF_{8\%,\ 10\ years})$$
$$= 2000 (0.463)$$
$$= Tk.926$$

*** PVIF=Present Value Interest Factor**

Present value of $1 at end period (partial)

Period	1%	1.50%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.9901	0.9852	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091
2	0.9803	0.9707	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264
3	0.9706	0.9563	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513
4	0.9610	0.9422	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830
5	0.9515	0.9283	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209
6	0.9420	0.9145	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645
7	0.9327	0.9010	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132
8	0.9235	0.8877	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665
9	0.9143	0.8746	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241
10	0.9053	0.8617	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855
11	0.8963	0.8489	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505
12	0.8874	0.8364	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186
13	0.8787	0.8240	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897
14	0.8700	0.8119	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633
15	0.8613	0.7999	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394

Understanding the Basics

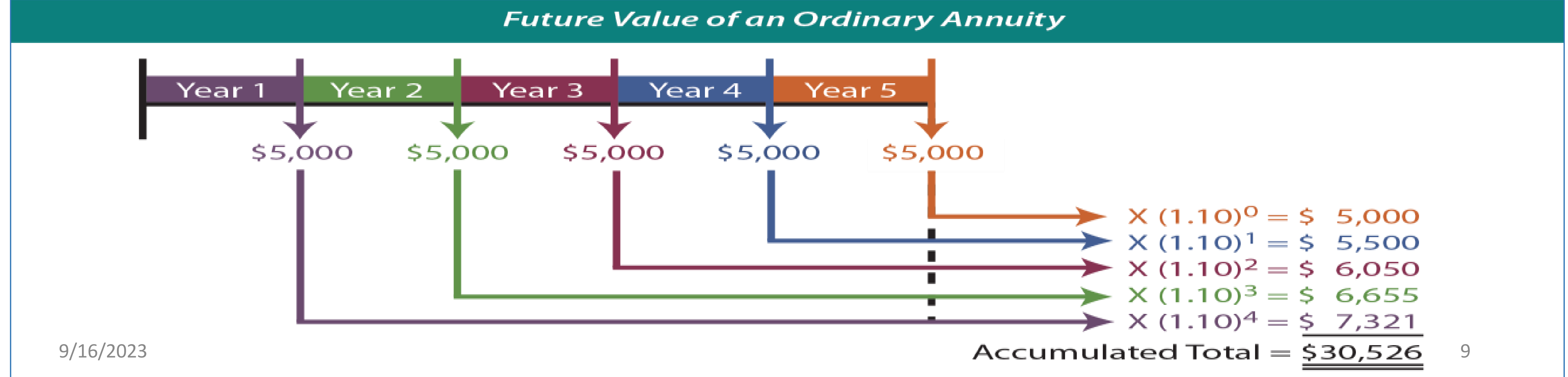
Time Value of Money: Key Concepts

Annuity: An annuity is a series of equal receipts or payments occurring over a specified number of periods.

Types of Annuity: Annuity can be of two types based on the timing of cash flows. These are:

- **Ordinary annuity:** Payments or receipts occur at the end of each period.
- **Annuity due:** Payments or receipts occur at the beginning of the period

Future Value of Annuity (Ordinary): Many of us have MSS (DPS) account in banks, which is required to pay a certain amount of money at the end of/at the beginning of each certain period. Bank gives us interest/profit on deposited money. You might ask the bank about the total amount of money that you will receive after a certain period while you deposit a certain amount (Say Tk.5000) at the end of each year for next 5 years.



Understanding the Basics

Time Value of Money: Key Concepts

Future Value of Annuity:

$$FVA_n = PMT\left(\left[(1+i)^n - 1\right]/i\right) \ldots\ldots\ldots\ldots (3)$$

Where,

FVA_n= Future value of annuity after n period

PMT= Periodic payments.

i= Interest/profit rate

n = Number of years.

Thus,

$$FVA_5 = PMT\left(\left[(1+i)^n - 1\right]\right.$$

$= 5000([(1+0.10)^5 - 1]/0.10)$

$= 5000(6.1052)$

= Tk. 30,526

Alternatively $FVA_n = PMT\,(FVIFA_{i,\,n})$

$FVA_n = 5000\,(FVIFA_{10\%,\ 5\ years})$

$= 5000(6.105)$

= Tk.30,525

If Annuity due (payment made at the beginning of period):

$$FVAD_n = PMT\left(\left[(1+i)^n - 1\right]/i\right)(1+i) \ldots\ldots\ldots\ldots (4)$$

$$\text{Or, } FVAD_n = PMT\,(FVIFA_{i,\,n})\,(1+i)$$

Future Value of an Ordinary Annuity Table

$$\text{Factor} = \frac{[(1+i)^n - 1]}{i}$$

Period (n)	Rate (i) 1%	2%	3%	5%	8%	10%	12%
1	1.000	1.000	1.000	1.000	1.000	1.000	1. 000
2	2.010	2.020	2.030	2.050	2.080	2.100	2.120
3	3.030	3.060	3.091	3.153	3.246	3.310	3.374
4	4.060	4.122	4.184	4.310	4.506	4.641	4.779
5	5.101	5.204	5.309	5.526	5.867	6.105	6.353
6	6.152	6.308	6.468	6.802	7.336	7.716	8.115
7	7.214	7.434	7.662	8.142	8.923	9.487	10.089
8	8.286	8.583	8.892	9.549	10.637	11.436	12.300
9	9.369	9.755	10.159	11.027	12.488	13.579	14.776
10	10.462	10.950	11.464	12.578	14.487	15.937	17.549
11	11.567	12.169	12.808	14.207	16.645	18.531	20.655
12	12.683	13.412	14.192	15.917	18.977	21.384	24.133
13	13.809	14.680	15.618	17.713	21.495	24.523	28.029
14	14.947	15.974	17.086	19.599	24.215	27.975	32.393
15	16.097	17.293	18.599	21.579	27.152	31.772	**37.280**

Understanding the Basics

Time Value of Money: Key Concepts

Present Value of Annuity: The present value of an annuity is **the cash value of all of your future equal payments/receipts**. The rate of return or discount rate is part of the calculation. An annuity's future payments are reduced based on the discount rate. Thus, the higher the discount rate, the lower the present value of the annuity is.

Present Value of an Ordinary Annuity

Year 1 | Year 2 | Year 3 | Year 4 | Year 5

$5,000 | $5,000 | $5,000 | $5,000 | $5,000

$\$\ 4,545 = (1/(1.10)^1) \times$

$\$\ 4,132 = (1/(1.10)^2) \times$

$\$\ 3,757 = (1/(1.10)^3) \times$

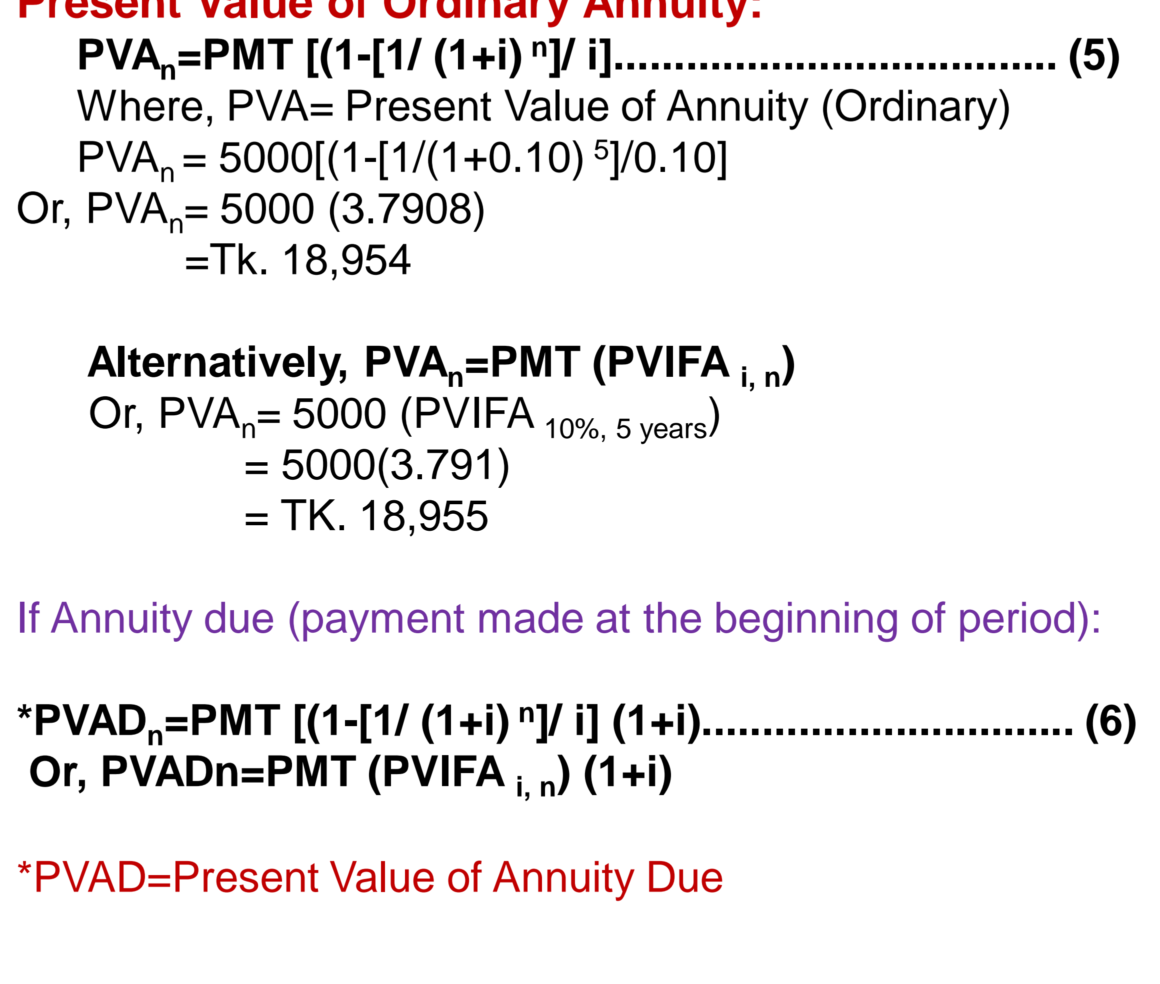
$\$\ 3,415 = (1/(1.10)^4) \times$

$\$\ 3,105 = (1/(1.10)^5) \times$

$18,954 = Total Present Value

Understanding the Basics

Time Value of Money: Key Concepts



Present Value of Ordinary Annuity:

PVA_n=PMT [(1-[1/ (1+i) ^{n}]/ i]...................................... (5)

Where, PVA= Present Value of Annuity (Ordinary)

PVA_n = 5000[(1-[1/(1+0.10) ^{5}]/0.10]

Or, PVA_n= 5000 (3.7908)

=Tk. 18,954

Alternatively, PVA_n=PMT (PVIFA $_{i,\ n}$)

Or, PVA_n= 5000 (PVIFA $_{10\%,\ 5\ years}$)

= 5000(3.791)

= TK. 18,955

If Annuity due (payment made at the beginning of period):

***$PVAD_n$=PMT [(1-[1/ (1+i) ^{n}]/ i] (1+i)............................... (6)**

Or, PVADn=PMT (PVIFA $_{i,\ n}$) (1+i)

*PVAD=Present Value of Annuity Due

Present Value of an Ordinary Annuity Table

Period (n)	Rate (i) 1%	2%	3%	5%	8%	10%
1	0.990	0.980	0.971	0.952	0.926	0.909
2	1.970	1.942	1.913	1.859	1.783	1.736
3	2.941	2.884	2.829	2.723	2.577	2.487
4	3.902	3.808	3.717	3.546	3.312	3.170
5	4.853	4.713	4.580	4.329	3.993	3.791
6	5.795	5.601	5.417	5.076	4.623	4.355
7	6.728	6.472	6.230	5.786	5.206	4.868
8	7.652	7.325	7.020	6.463	5.747	5.335
9	8.566	8.162	7.786	7.108	**6.247**	5.759

Understanding the Basics

Time Value of Money: Key Concepts

Problems of Mixed Flow:

Many time value of money problems that we face involve neither a single cash flow nor a single annuity. Instead, we may encounter a mixed or uneven pattern of cash flows.

Future value of mixed flows:

Example: Suppose you have decided to deposit the following cash (given in the table below) in a commercial bank at 10% annual interest/Profit rate. What will be the future value after five years of your deposited money?

Beginning of the year	Deposit (Tk.)
1	1000
2	2000
3	3000
4	4000
5	5000

$FV_n = PV_0 (1+i)^n$

Calculation of Future Value of Mixed Cash Flows:

Future value after five years (FV_5) of Tk.1000 (1st year) = 1000 $(1+.10)^5$= Tk. 1,610.51

Future value after five years (FV_5) of Tk.2000 (2nd year)= 2000 $(1+.10)^4$= Tk. 2,928.20

Future value after five years (FV_5) of Tk.3000 (3rd year) = 3000 $(1+.10)^3$= Tk. 3,993.00

Future value after five years (FV_5) of Tk.4000 (4^{th}year) = 4000 $(1+.10)^2$= Tk. 4,840.00

Future value after five years (FV_5) of Tk.5000 (5^{th}year) = 5000 $(1+.10)^1$= Tk. 5,500.00

Future value after five years (FV_5) of all deposited money = Tk.18,871.71

Understanding the Basics

Time Value of Money: Key Concepts

Present Value of Mixed Flows: Present value of mixed cash flows help in determining the investment decision.

Example: Suppose you have an investment opportunity of investing Tk. 50,000 now. The investment will generate the following cash inflows. If the discount rate is 8% will it be wise to invest in the project?

End of the year	Cash Inflow (Tk.)
1	15,000
2	20,000
3	15,000
4	15,000
5	10,000

$PV_0 = FV_{n/} (1+i)^n$

Decision: Since NPV is positive, the project is accepted

Calculation of Present Value of Future Cash Inflow:

Present value (PV_0) of Tk. 15,000 received after one year = $15{,}000/(1+.08)^1$ = Tk.13,888.88

Present value (PV_0) of Tk. 20,000 received after two year = $20{,}000/(1+.08)^2$ = Tk.17,146.78

Present value (PV_0) of Tk. 15,000 received after three year = $15{,}000/(1+.08)^3$ = Tk.11,907.48

Present value (PV_0) of Tk. 15,000 received after four year = $15{,}000/(1+.08)^4$ = Tk.11,025.44

Present value (PV_0) of Tk. 10,000 received after five year = $10{,}000/(1+.08)^5$ = Tk. 6,805.83

Present value of all cash inflows	Tk. 60,774.41
(-) Initial Investment	Tk. 50,000.00
Net present value (NPV)	Tk. 10,774.41

Understanding the Basics

Time Value of Money: Key Concepts

Compounding more than once a year:

$$FV_n = PV_0 (1 + [i/m])^{mn} \text{..(7)}$$

Where, m=Number of compounding in year

The future value after 3 years of Tk.100 @ 8% Interest Rate under **quarterly compounding**-

$FV_3 = 100 (1 + [.08/4])^{(4)(3)}$

$= 100 (1 + .02)^{12}$

$=$ Tk.126.82

The future value after 3 years of Tk.100 @ 8% Interest Rate under **semiannual compounding**-

$FV_3 = 100 (1 + [.08/2])^{(2)(3)}$

$= 100 (1+. 04)^{6}$

$=$ Tk.126.53

The future value after 3 years of Tk.100 @ 8% Interest Rate under **annual compounding**-

$FV_3 = 100 (1 + [.08/1])^{(1)(3)}$

$= 100 (1 + .08)^{3}$

$=$ Tk.125.97

The more the number of compounding in a year, the more the future value

Understanding the Basics

Time Value of Money: Key Concepts

Effective Annual Interest Rate:
Effective interest rate is the actual rate of interest earned (paid) after adjusting the *nominal* rate for factors such as the number of compounding periods per year.

Effective Annual Interest Rate= $(1+ [i/m])^{m}-1$……………………………….. (8)

Problem: A savings plan offered a nominal interest rate of 8%. What will be the effective interest rate if the interest is compounded: a) Yearly; b)Semiannually; c)Quarterly & d)Monthly.

Solution: Effective Annual Interest Rate= $(1+ [i/m])^{m}-1$

a) $EAIR_{(yearly)} = (1+ [.08/1])^{1}-1$
$= .08 = 8\%$

b) $EAIR_{(Semiannually)} = (1+ [.08/2])^{2}-1$
$= .0816= 8.16\%$

c) $EAIR_{(Quarterly)} = (1+ [.08/4])^{4}-1$
$= .0824= 8.24\%$

d) $EAIR_{(Monthly)} = (1+ [.08/12])^{12}-1$
$= .0829= 8.29\%$

Understanding the Basics

Capital Budgeting Techniques

Capital budgeting techniques are **the methods to evaluate an investment proposal in order to help the company** decide upon the desirability of such a proposal. These techniques are categorized into two heads: traditional methods and discounted cash flow methods.

Techniques of capital budgeting

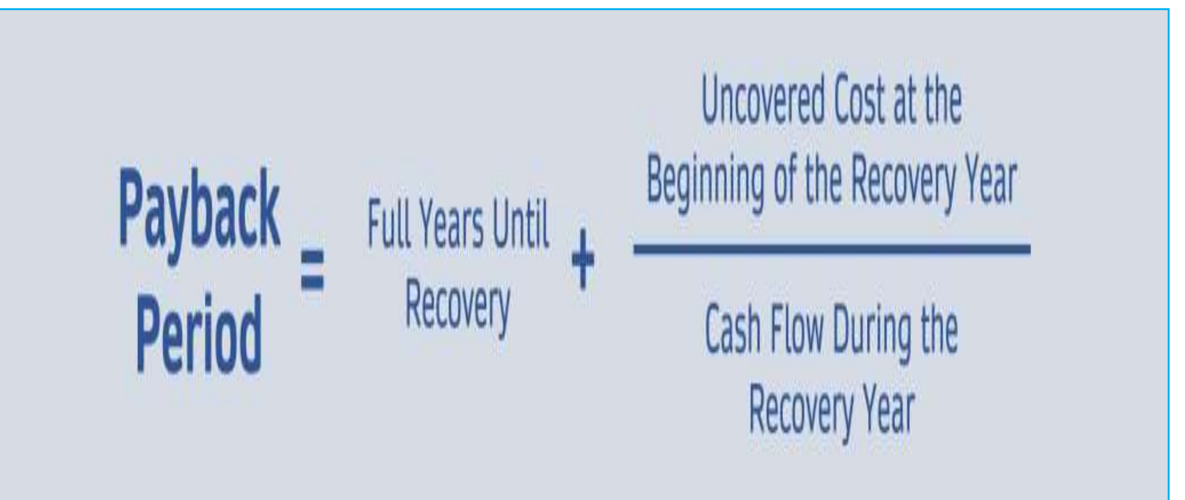
Understanding the Basics

Capital Budgeting Techniques: Traditional

1. Payback Period: The payback period (PBP) of an investment project tells us the number of years required to recover our initial cash investment based on the project's expected cash flows.

Initial investment: $200,000

Year	Cash inflow	Cumulative cash inflow
1	$ 70,000	$ 70,000
2	60,000	130,000
3	55,000	185,000
4	40,000	225,000
5	30,000	255,000
6	25,000	280,000



Payback Period (PBP): 3 Years+ (200,000-185,000)/40,000 = (3+0.375) Years= 3.375 Years

Decision Criteria:

If the calculated PBP<Acceptable PBP----Accept the Project
If the calculated PBP>Acceptable PBP---- Reject the Project

Understanding the Basics

Capital Budgeting Techniques: Traditional

2. Accounting Rate of Return:
Accounting rate of return (ARR) is a formula that reflects the percentage rate of return expected on an investment, or asset, compared to the initial investment's cost.

Particulars	Amount in Tk.
Initial Investment	100,000
Profit Net Income Y1	10,000
Profit Net Income Y2	20,000
Profit Net Income Y3	25,000
Profit Net Income Y4	30,000
Profit Net Income Y5	35,000
Average Net Income	24,000
ARR (Average Net Income/Initial Investment)	24%

Decision Criteria:
If the calculated ARR>Acceptable ARR---- Accept the Project
If the calculated ARR<Acceptable ARR---- Reject the Project

Understanding the Basics

Capital Budgeting Techniques: Discounted Cash Flow Technique

1. **Net Present Value:**
   NPV is used in capital budgeting and investment planning to analyze the profitability of a projected investment or project. Net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows over a period of time. Calculate the NPV of the following problem @ 12% discount rate

Particulars	Initial Year	Year 1	Year 2	Year 3	Year 4
Cash Outflow	(100,000)	-	-	-	-
Cash Inflow	-	34,432	39,530	39,359	32,219

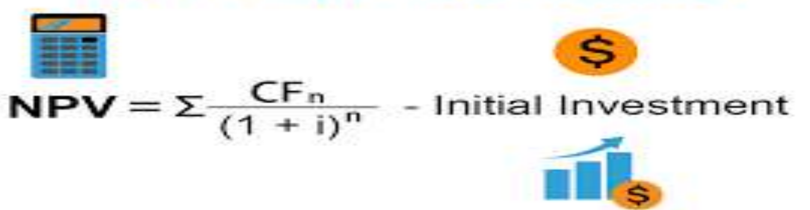
$$NPV = \frac{Tk.34{,}432}{(1+.12)^1} + \frac{Tk.39{,}530}{(1+.12)^2} + \frac{Tk.39{,}359}{(1+.12)^3} + \frac{Tk.32{,}219}{(1+.12)^4} - Tk.100{,}000$$

Or, alternatively,

$NPV = [Tk.34{,}432(PVIF_{12\%,1}) + Tk.39{,}530(PVIF_{12\%,2}) + Tk.39{,}359(PVIF_{12\%,3}) + Tk.Tk.32{,}219(PVIF_{12\%,4})] - Tk.100{,}000$

$= [Tk.30{,}748 + Tk.31{,}505 + Tk.28{,}024 + Tk.20{,}491] - Tk.100{,}000$

$= Tk.\ 10{,}768.$



$$NPV = \frac{CF_1}{(1+i)^1} + \frac{CF_2}{(1+i)^2} + \dots\dots\dots + \frac{CF_n}{(1+i)^n} - ICO$$

Decision Criteria:
If NPV>0 --- Accept the Project
If NPV<0 --- Reject the Project

Understanding the Basics

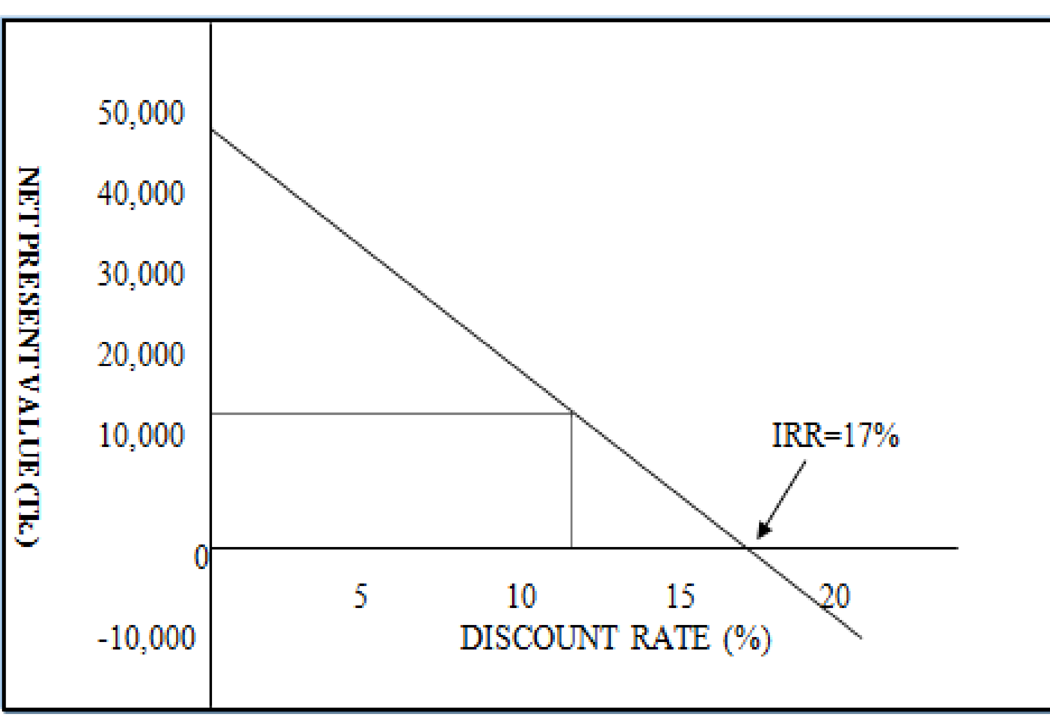
Capital Budgeting Techniques: Discounted Cash Flow Technique

2. Internal Rate of Return:

The internal rate of return (IRR) for an investment proposal is the discount rate that equates the present value of the expected net cash flows (CFs) with the initial cash outflow (ICO).

That is, IRR is the rate at which Present Value of Cash Inflows=Initial Investment/Present Value of Cash Outflow.

$$ICO = \frac{CF_1}{(1+IRR)^1} + \frac{CF_2}{(1+IRR)^2} + \dots\dots + \frac{CF_n}{(1+IRR)^N}$$



Decision Criteria:

If IRR> Discount Rate---- Accept the Project
If IRR< Discount Rate----- Reject the Project
If IRR= Discount Rate----- NPV=0

Understanding the Basics

Capital Budgeting Techniques: Discounted Cash Flow Technique

Calculation of IRR:

Particulars	Initial Year	Year 1	Year 2	Year 3	Year 4
Cash Outflow	(100,000)	-	-	-	-
Cash Inflow	-	34,432	39,530	39,359	32,219

$$IRR = r_a + \frac{NPV_a}{NPV_a - NPV_b}(r_b - r_a)$$

r_a = lower discount rate chosen
r_b = higher discount rate chosen
N_a = NPV at r_a
N_b = NPV at r_b

YEAR	NET CASH FLOWS		PVIF AT 15%		PRESENT VALUES
1	34,432	×	.870	=	29,955.84
2	39,530	×	.756	=	29,884.68
3	39,359	×	.658	=	25,898.22
4	32,219	×	.572	=	18,429.27
Present Value of Cash Inflow					104,168.01
NPV @ 15% Discount Rate					4,168.01

YEAR	NET CASH FLOWS		PVIF AT 20%		PRESENT VALUES
1	34,432	×	.833	=	28,681.86
2	39,530	×	.694	=	27,433.82
3	39,359	×	.579	=	22,788.86
4	32,219	×	.482	=	15,529.56
Present Value of Cash Inflow					94,434.10
NPV @20% Discount Rate					-5,565.90

IRR= 0.15+ 4,168.01/[(4,168.01- (-5,565.90)] *(0.20-0.15)
= 0.15+ (4,168.01/9,733.91)*0.05
= 0.15+0.0214= 0.1714= 17.14%

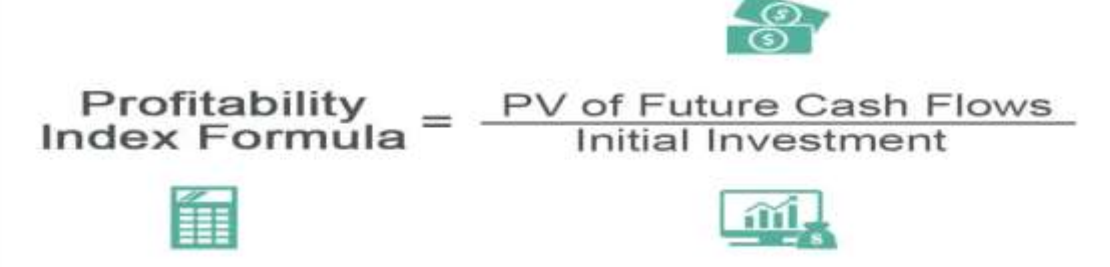
Understanding the Basics

Capital Budgeting Techniques: Discounted Cash Flow Technique

3. Profitability Index

The profitability index (PI), or benefit-cost ratio, of a project is the ratio of the present value of future net cash flows to the initial cash outflow. It can be expressed as:

$$PI = \left[\frac{CF_1}{(1+K)^1} + \frac{CF_2}{(1+K)^2} + \ldots\ldots + \frac{CF_n}{(1+k)^n} \right] \div ICO$$



PI= (30,748+ 31, 505+28,024+20, 491) ÷100, 000
= 110,768 ÷100,000
=1.11

Thus, the Project is acceptable.

Decision Criteria:

If PI> 1---- Accept the Project
If PI< 1----- Reject the Project
If PI= 1----- NPV=0

Understanding the Basics

Capital Budgeting Techniques: Discounted Cash Flow Technique

Capital Rationing:

- Capital rationing is a strategy used by companies or investors to limit the number of projects they take on at a time. If there is a pool of available investments that are all expected to be profitable, capital rationing helps the investor or business owner choose the most profitable ones to pursue.
- With a capital rationing constraint, the firm attempts to select the combination of investment proposals that will provide the greatest increase in the value of the firm subject to not exceeding the budget ceiling constraint.

PROJECT	INITIAL CASH OUTFLOWS (TK.)	IRR (%)	NPV(Tk.)	PI
A	50,000	15	12,000	1.24
B	35,000	19	15,000	1.43
C	30,000	28	42,000	2.40
D	25,000	26	1,000	1.04
E	15,000	20	10,000	1.67
F	10,000	37	11,000	2.10
G	10,000	25	13,000	2.30
H	1,000	18	100	1.10

Requirements:

Which Projects would you choose if you have budget constraint of Tk.65,000?

Definitely you should choose the projects that will generate higher NPV. In order to solve the problem you have to go by PI

Projects C (PI-2.40), G(PI-2.30), F (PI-2.10) and E (PI-1.67) will have NPV of Tk.76,000 which is the highest in all combination of investment of Tk.65,000 of budget ceiling

Understanding the Basics

Capital Budgeting Techniques: Discounted Cash Flow Technique

Selected by NPV			Selected by IRR				Selected by PI			
Project	NPV	Fund	Project	IRR	Fund	NPV	Project	PI	Fund	NPV
C	42,000	30,000	F	37%	10,000	11,000	C	2.4	30,000	42,000
B	15,000	35,000	C	28%	30,000	42,000	G	2.3	10,000	13,000
	57,000	65,000	D	26%	25,000	1,000	F	2.1	10,000	11,000
					65,000	54,000	E	1.67	15,000	10,000
									65,000	76,000

PROJECT	INITIAL CASH OUTFLOWS (TK.)	IRR (%)	NPV(Tk.)	PI
A	50,000	15	12,000	1.24
B	35,000	19	15,000	1.43
C	30,000	28	42,000	2.40
D	25,000	26	1,000	1.04
E	15,000	20	10,000	1.67
F	10,000	37	11,000	2.10
G	10,000	25	13,000	2.30
H	1,000	18	100	1.10

Understanding the Basics

Financing Mix

Table 8.1 Classification of Sources of Funds

Source of Funds Classification

On the basis of period

- **Long-term**
  - Equity shares
  - Retained earnings
  - Preference shares
  - Debentures
  - Loan from financial institutions
  - Loan from banks
- **Medium-term**
  - Loan from banks
  - Public deposits
  - Loan from financial Institutions
  - Lease financing
- **Short-term**
  - Trade credit
  - Factoring
  - Banks
  - Commercial paper

On the basis of ownership

- **Owner's Funds**
  - Equity shares
  - Retained earnings
- **Borrowed Funds**
  - Debentures
  - Loans from banks
  - Loans from financial institutions
  - Public deposits
  - Lease financing
  - Commercial Papers

On the basis of source of generation

- **Internal Sources**
  - Equity share capital
  - Retained earnings
- **External Sources**
  - Financial institutions
  - Loan from banks
  - Preference shares
  - Public deposits
  - Debenture
  - Lease financing
  - Commercial papers
  - Trade credit
  - Factoring

Understanding the Basics

Lease Financing

What is Lease Financing?
Lease financing is one of the important sources of medium- and long-term financing where the owner of an asset gives another person, the right to use that asset against periodical payments. The owner of the asset is known as lessor and the user is called lessee.

Types of Lease: Depending upon the transfer of risk and rewards to the lessee, the period of lease and the number of parties to the transaction, lease financing can be classified into two categories. Finance lease and operating lease.

Finance Lease: It is the lease where the lessor transfers substantially all the risks and rewards of ownership of assets to the lessee for lease rentals. In other words, it puts the lessee in the same condition as he/she would have been if he/she had purchased the asset.

Operating Lease: Lease other than finance lease is called operating lease. Here risks and rewards incidental to the ownership of asset are not transferred by the lessor to the lessee. The term of such lease is much less than the economic life of the asset and thus the total investment of the lessor is not recovered through lease rental

Understanding the Basics

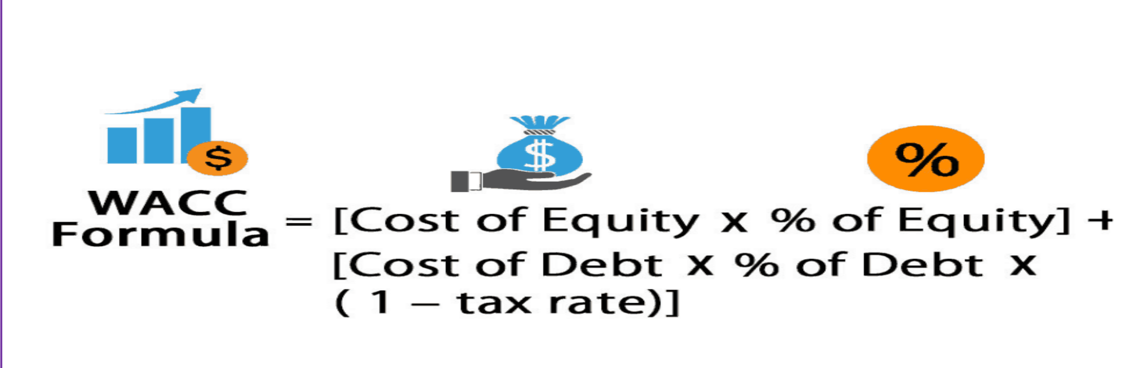
Cost of Capital

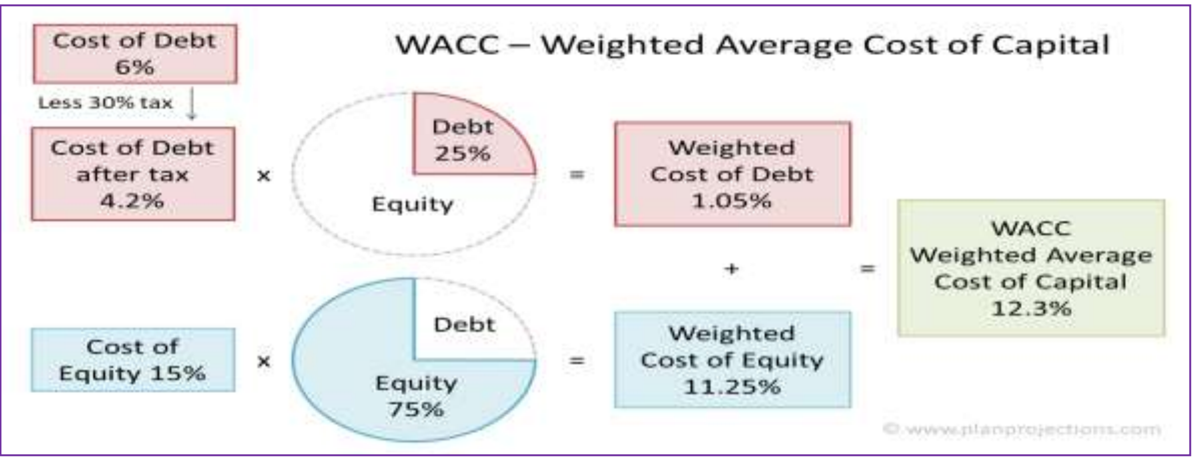
What is Cost of Capital?

In economics and accounting, the **cost of capital** is the cost of a company's funds (both debt and equity), or, from an investor's point of view it is the required rate of return on a portfolio company's existing securities. It is used to evaluate new projects of a company. It is the minimum return that investors expect for providing capital to the company, thus setting a benchmark that a new project has to meet.

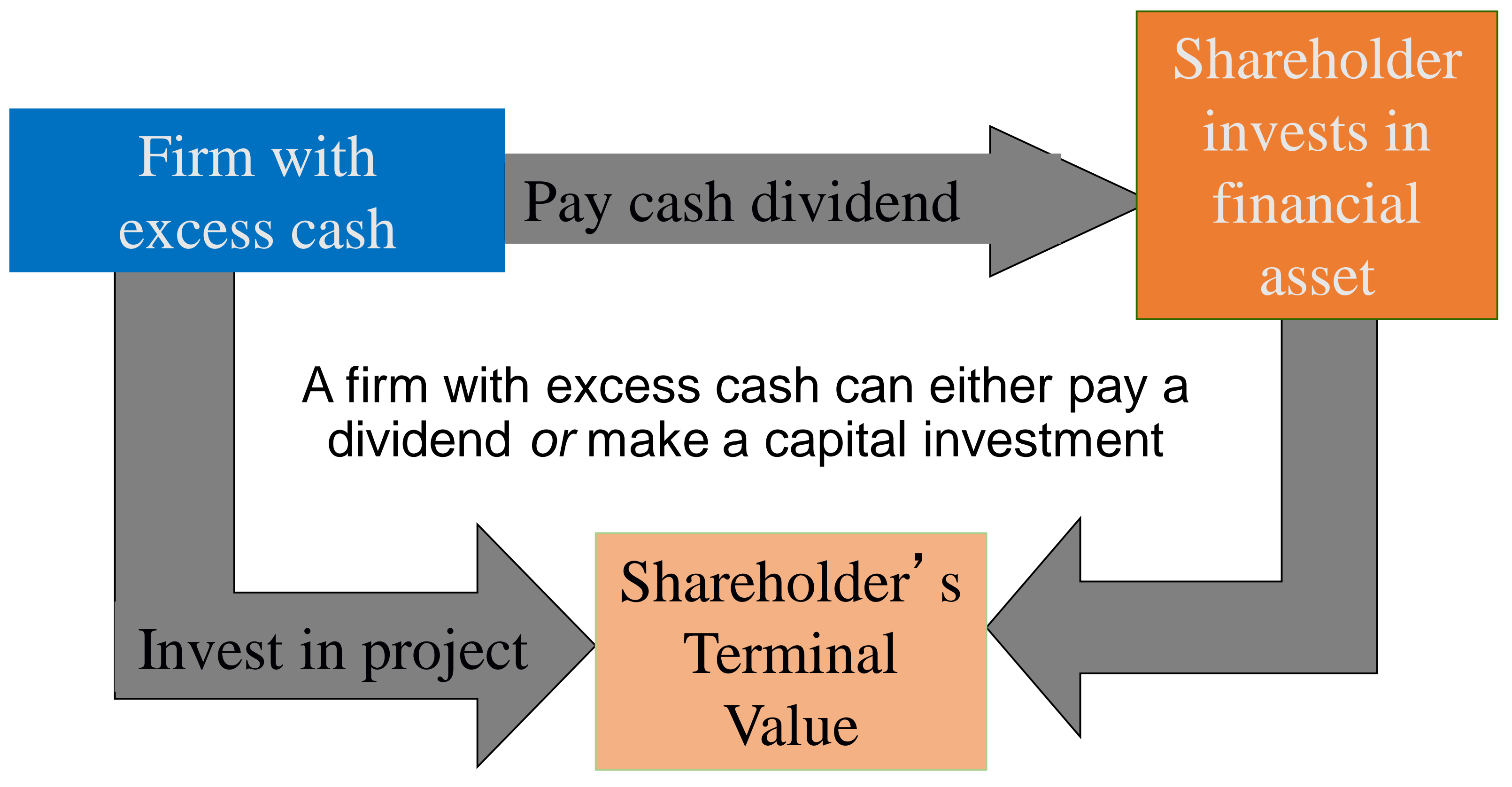
What is Weighted Average Cost of Capital?

The weighted average cost of capital (WACC) is a calculation of a firm's cost of capital in which each category of capital is proportionately weighted. All sources of capital, including common stock, preferred stock, bonds, and any other long-term debt, are included in a WACC calculation.





The Cost of Equity Capital



The Cost of Equity Capital: Capital Assets Pricing Model

- From the firm's perspective, the expected return is the Cost of Equity Capital:

$$\overline{R}_s = R_F + \beta(\overline{R}_M - R_F)$$

- To estimate a firm's cost of equity capital, we need to know three things:
  1. The risk-free rate, R_F
  2. The market risk $\overline{R}_M - R_F$
  3. The company beta (Sensitivity of a stock's return to the return on the market portfolio.

Determinants of Beta

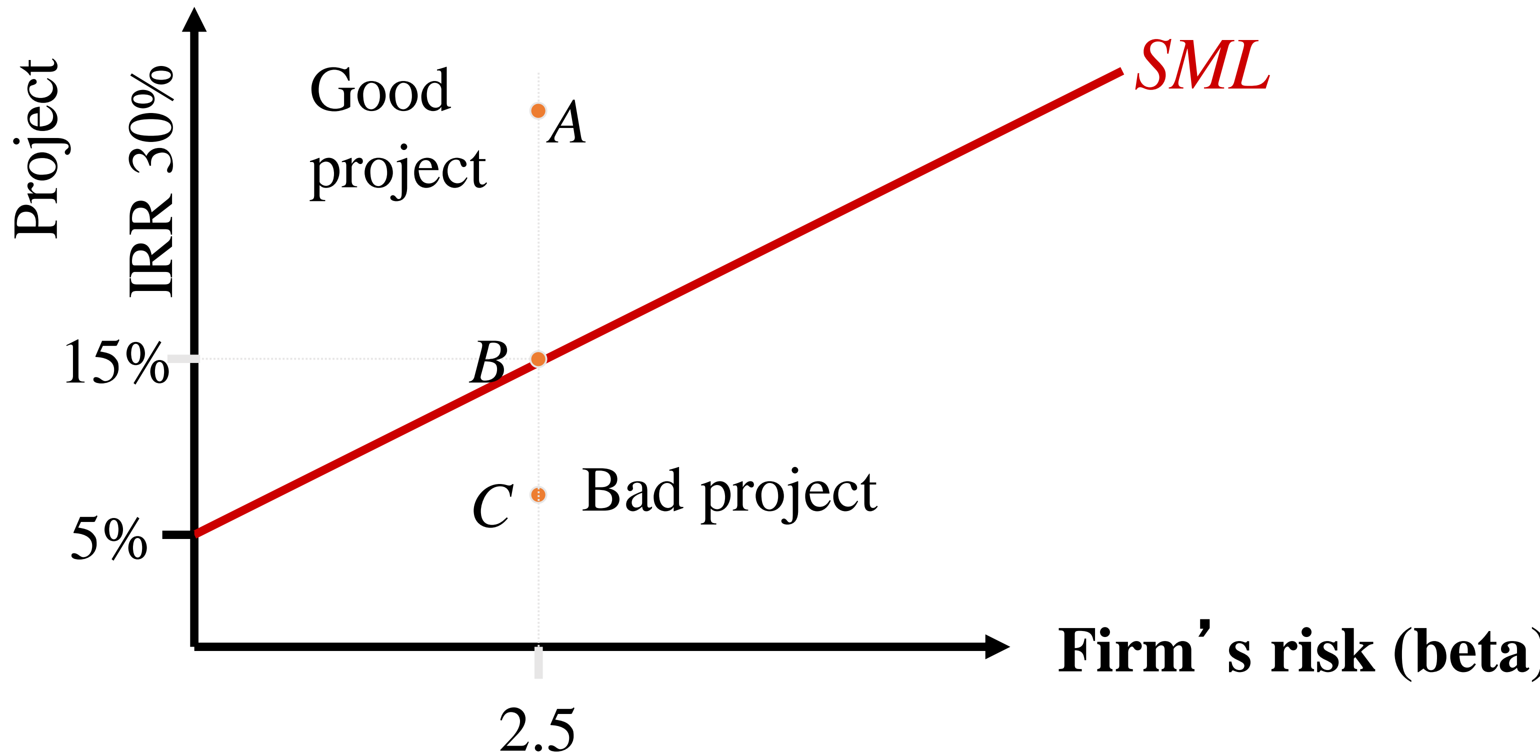
- Business Risk

  1. Cyclicality of Revenues
  2. Operating Leverage (the degree of operating leverage measures how sensitive a firm (or project) is to its fixed costs.

- Financial Risk

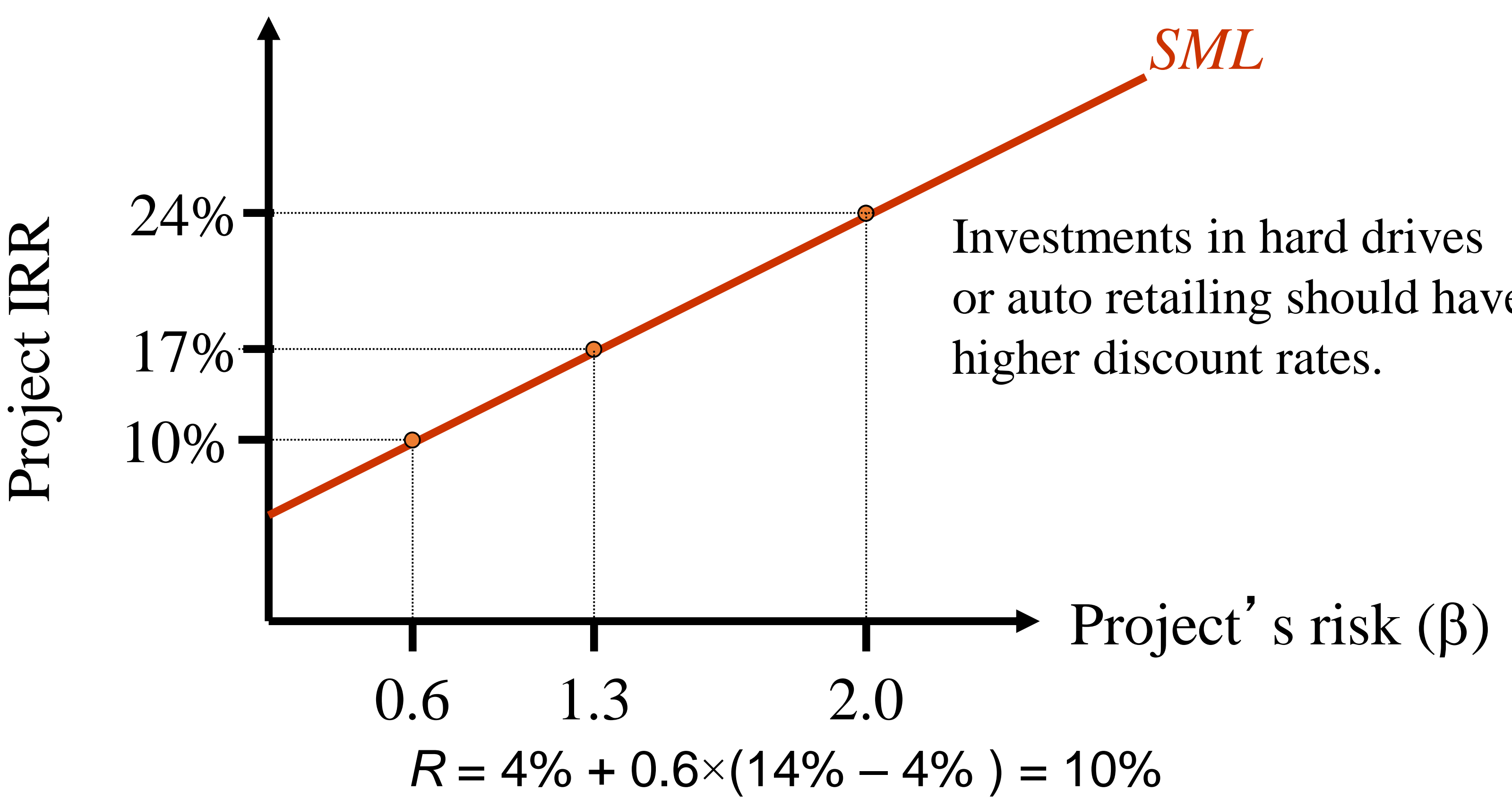
  3. Financial Leverage (Financial leverage is the sensitivity to a firm's fixed costs of financing)

Using the Security Market Line(SML)



An all-equity firm should accept projects whose IRRs exceed the cost of equity capital and reject projects whose IRRs fall short of the cost of capital.

Capital Budgeting & Project Risk



$R = 4\% + 0.6 \times (14\% - 4\%) = 10\%$

10% reflects the opportunity cost of capital on an investment in electrical generation, given the unique risk of the project.

The Cost of Equity Capital:
Dividend Discount Model (DDM)

$$R_s = \frac{D_1}{P} + g$$

- Where D1=Dividend of the next years, P=Market Price; g= Growth Rate
- The DDM is an alternative to the CAPM for calculating a firm's cost of equity.
- The DDM and CAPM are internally consistent, but academics generally favor the CAPM and companies seem to use the CAPM more consistently.
- The CAPM explicitly adjusts for risk and it can be used on companies that do not pay dividends.

Cost of Debt

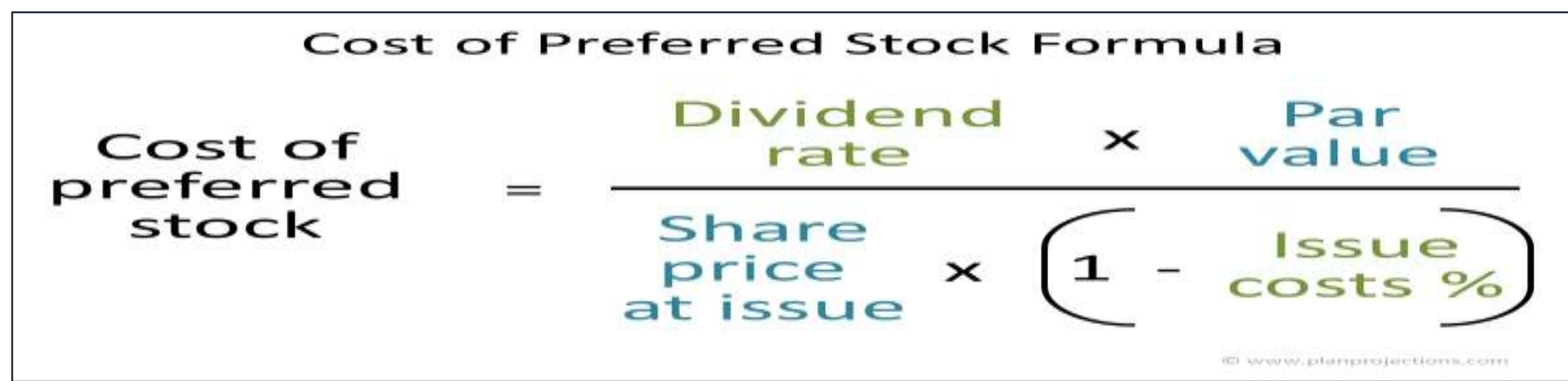
- The cost of debt is **the effective rate that a company pays on its debt**, such as bonds and loans.
- The after-tax cost of debt is the interest paid on debt less any income tax savings due to deductible interest expenses.

Cost of Debt

$$\text{Cost of debt} = \frac{\text{Interest expense}}{\text{Total debt}} \times (1 - \text{tax rate})$$

Cost of Preferred Stock

- Preferred stock is a highbred security which carries both the feature of bond and equity
- Preferred stock is a perpetuity, so its price is equal to the coupon paid divided by the current required return.



Identification of Problem is the Half of Solution

Problems & Solutions

1) ABC Company is considering a proposal to purchase a machine costing Tk. 10,00,000 initially. The machine is expected to have economic life of 5(five) years with salvage value of Tk.100,000. The expected profit before depreciation and tax is shown in the following table. The company follows straight line depreciation method. Assume tax rate is 50% and also assume cost of capital is 15%.

End of the year	Amount of cash flow (in Tk.)	Present Value Interest Factor(PVIF) @15% Discount Rate
1	250,000	0.870
2	300,000	0.756
3	350,000	0.658
4	250,000	0.572
5	200,000	0.497

Requirements:

1) Will it be wise to purchase the machine? Give your decision based on NPV method.

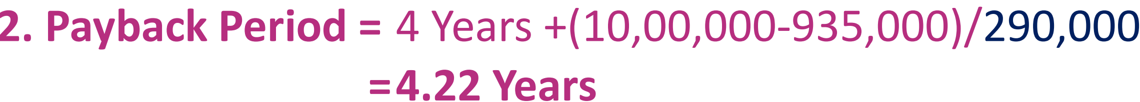
2) Calculate the Payback Period of the machine

1)

End of the year (1)	Cash Flow Before Tax and Depreciation (2)	Depreciation (3)	EBT 4= (2-3)	Tax @50% 5=50% of 4	EAT 6=4-5	Net Cash Benefit 7=(6+3)	Cumulative Cash Flow (8)	PVIF@15% Discount Rate (9)	PV of NCB 10=(7*9)
1	250,000	180,000	70,000	35,000	35,000	215,000	215,000	0.870	187,050
2	300,000	180,000	120,000	60,000	60,000	240,000	455,000	0.756	181,440
3	350,000	180,000	170,000	85,000	85,000	265,000	720,000	0.658	174,370
4	250,000	180,000	70,000	35,000	35,000	215,000	935,000	0.572	122,980
5	200,000	180,000	20,000	10,000	10,000	190,000	1,125,000	0.497	94,430
5	100,000 (SV)					100,000	1,225,000	0.497	49,700
							PV of NCB		**809,970**
							Less Net Cash Outflow		**(1,000,000)**
							NPV		**(190,030)**

1) Decision: It will not be wise to purchase the machine as NPV of the machine is Negative

Calculation of Depreciation of Machine= (Cost of Machine-Salvage Value)/Estimated Life
= (10,00,000-100,000)/5
= Tk. 180,000


2. Payback Period = 4 Years +(10,00,000-935,000)/290,000
=4.22 Years

Problems & Solutions

2) RB Fashion has the following capital structure on December 31, 2020

Source of Capital:	**Amount (Tk.)**
Ordinary Share Capital (800,000 Shares)	8,000,000
10% Preference Share	2,000,000
14% Debenture	6,000,000
Total	16,000,000

The share of the company sells for Tk.20. It is expected that company will pay next year a dividend of Tk.2 per share which will grow @5% forever. Assume 40% tax rate.

Requirements:

i) **Compute weighted average cost of capital (WACC) based on existing capital structure**

ii) **Compute the new weighted average cost of capital (WACC) if the company raises an additional Tk. 40,00,000 debt by issuing 15% subordinated bond. This would result to increase in expected dividend to Tk.3 per share with same growth rate.**

2(i)

Ordinary Share	8,000,000
10% Preference Share	2,000,000
14% Debenture	6,000,000
Current Market Price	20
Growth Rate	0.05
Dividend of Next Year (D1)	2

Cost of Common Stock	Ke=(D1/Current Market Price) +G=(2/20)+0.05	=0.15=15%
Cost of Preferred Stock @10%	Dps=Rate of Preferred Dividend	=0.10=10%
Cost of Debenture @14%	De=Dc(1-Tax Rate)=0.14*(1-0.40)	=0.084=8.40%

i) Weighted Average Cost of Capital

Particulars (1)	Amount(2)	Weightage(3)	Cost(4)	Weighted Cost (5=3*4)
Ordinary Share	8,000,000	0.500	0.150	0.0750
10% Preference Share	2,000,000	0.125	0.100	0.0125
14% Debenture	6,000,000	0.375	0.084	0.0315
Total	16,000,000	1.000	WACC	0.1190=11.90%

D1=D0(1+G)=2.1 [If D1 is not given]
(where D0=Dividend of Current year

2(ii)

Ordinary Share	8,000,000
10% Preference Share	2,000,000
14% Debenture	6,000,000
15% Subordinated Bond	**4,000,000**
Current Market Price	20
Growth Rate	0.05
Dividend/Share of Next Year (D1)	**3**

Revised Cost of Common Stock	Ke=(D1/Current Market Price) +G=(3/20)+0.05	=0.20=20%
Cost of Subordinated Bond	Ds=DSc (1-Tax Rate)=0.15*(1-0.40)	=0.09=9%

ii) Weighted Average Cost of Capital

Particulars (1)	**Amount(2)**	**Weightage (3)**	**Cost (4)**	**Weighted Cost(5=3*4)**
Ordinary Share	8,000,000	0.40	0.200	0.08
10% Preference Share	2,000,000	0.10	0.100	0.01
14% Debenture (from previous)	6,000,000	0.30	0.084	0.0252
15% Subordinated Bond	4,000,000	0.20	0.090	0.018
Total	20,000,000	1.00	**WACC**	**13.32%**

Problems & Solutions

3) Mr. X wishes to purchase an annuity contract that will pay him Tk. 7,000 a year for the rest of his life. The Delta Life Insurance Company figures that his life expectancy is 9 years, based on actuary tables. The company imputes a compound annual profit rate of 10% in its annuity contract.

Requirements:

i) **How much will he have to pay for the annuity?**

ii) **How much would he have to pay if the profit rate were 8%?**

3)

We are Given,

Payment (PMT)	Tk. 7000
Interest Rate (i)	i) 10% and ii) 8%
Number of Years (n)	9 Years
How much Mr. X Will have to Pay Now?	i.e., Present Value of Annuity (PVA)

We Know, $PVA_n = PMT\ [(1-[1/(1+i)^n]/i]$

Or, $PVA_n = PMT\ (PVIFA_{i,\ n})$

i) $PVA_9 = 7{,}000\ (PVIFA_{10\%,\ 9})$

$= 7{,}000 * 5.759$

$= 40{,}313$

ii) $PVA_9 = 7{,}000\ (PVIFA_{8\%,\ 9})$

$= 7{,}000 * 6.247$

$= 43{,}729$

Present Value of an Ordinary Annuity Table

Period (n)	Rate (i) 1%	2%	3%	5%	8%	10%
1	0.990	0.980	0.971	0.952	0.926	0.909
2	1.970	1.942	1.913	1.859	1.783	1.736
3	2.941	2.884	2.829	2.723	2.577	2.487
4	3.902	3.808	3.717	3.546	3.312	3.170
5	4.853	4.713	4.580	4.329	3.993	3.791
6	5.795	5.601	5.417	5.076	4.623	4.355
7	6.728	6.472	6.230	5.786	5.206	4.868
8	7.652	7.325	7.020	6.463	5.747	5.335
9	8.566	8.162	7.786	7.108	**6.247**	5.759

Problems & Solutions

4) You have currently Tk. 100,000 to deposit in an Islamic Bank under Mudaraba Term Deposit (MTDR) on Auto Renewal basis. You have been informed that the provisional rate of profit for 3 months MTDR is 7% followed by 7.50% for 6 months and 7.75% for 12 months.

Requirements:

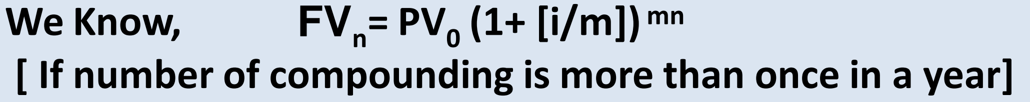
i) What would you get at the end of three years on each alternative?

ii) What would be the effective rate of return on each alternative and which plan should you choose?

4) (i)

We are Given,

Principal Amount	Tk. 100,000
Profit Rate Rate (i)	1) 7% for 3 months MTDR 2) 7.5% for 6 months MTDR 3) 7.75% for 1 year MTDR
Number of Years (n)	3 Years
i) How much you will get after 3 three years for each alternative?	**Future value after 3 years for all the three alternatives**
ii) What will be the Effective Annual Interest Rate (EAIR) for each alternative and which one will you choose?	Calculate the Effective Annual Interest Rate (EAIR) for each alternative and the best alternative will be where the EAIR is the highest.



1) $FV_{3\ (\text{Three Months MTDR})} = PV_0 (1+ [i/m])^{mn}$ where, i=7%, m=4

$= 100,000\ (1+ [0.07/4])^{4*3}$

$= \mathbf{123,143.93}$

2) $FV_{3\ (\text{Six Months MTDR})} = PV_0 (1+ [i/m])^{mn}$ where, i=7.50%, m=2

$= 100,000\ (1+ [0.075/2])^{2*3}$

$= \mathbf{124,717.85}$

3) $FV_{3\ (\text{1 Year MTDR})} = PV_0 (1+ [i/m])^{mn}$ where, i=7.75%, m=1

$= 100,000\ (1+ [0.0775/1])^{1*3}$

$= \mathbf{125,098.42}$

4) (ii)

We are Given,

Principal Amount	Tk. 100,000
Profit Rate Rate (i)	1) 7% for 3 months MTDR 2) 7.5% for 6 months MTDR 3) 7.75% for 1 year MTDR
Number of Years (n)	3 Years
i) How much you will get after 3 three years for each alternative?	Future value after 3 years for all the three alternatives
ii) What will be the Effective Rate of Return (ERR) for each alternative and which one will you choose?	Calculate the Effective Rate of Return (ERR) for each alternative and the best alternative will be where the ERR is the highest.

	Effective Annual Interest Rate= $(1+[i/m])^{m}-1$
1)	**EAIR (quarterly)= $(1+[i/m])^{m}-1$** **$=(1+[0.07/4])^{4}-1$** **=7.19%**
2)	**EAIR (Semi Annually))= $(1+[i/m])^{m}-1$** **$=(1+[0.075/2])^{2}-1$** **=7.64%**
3)	**EAIR (Yearly)= $(1+[i/m])^{m}-1$** **$=(1+[0.0775/1])^{1}-1$** **=7.75%**

Q&A

Thank You!

to all!

DIPLOMA IN ISLAMIC BANKING
MANAGEMENT ACCOUNTING & FINANCIAL MGT.
SOLUTION: EXAM- MAY- 2023

1) (b)

Contribution Margin (CM) = Sales - Variable cost

	Alif Ltd.	Mim Ltd.
Contribution Margin (CM)	Tk. (150,000 - 120,000) = 30,000 Tk.	Tk (150,000 - 100,000) = 50,000 Tk.
Contribution Margin Raitio (CM Ratio) = (Contribution Margin/Sales)	= 30,000/150,000 = 0.20	= 50,000/150,000 = 0.3333
(i) Break-even Point of Sales = (Fixed Cost/CM Ratio)	= 15,000/0.20 = Tk. 75000	= 35,000/0.3333 = Tk. 105,010
Margin of safety = (Sales - BE Sales)	= (150,000 - 75,000) = Tk. 75,000	= 150,000 - 105,010 = Tk. 44990

(ii) Volume of Revenue to earn profit of Tk. 50,000 = (Fixed cost + Desired Profit) / CM Ratio

	Alif Ltd.	Mim Ltd.
Volume of revenue to earn profit of Tk. 50,000	= (15,000 + 50,000)/0.20 = Tk 325,000	= (35,000 + 50,000)/0.3333 = Tk. 255,025

(iii) Considering contribution margin and fixed cost unchanged, Mim Ltd. will likely to earn greater profit in conditions of heavy demand as its contribution margin is higher compared with Alif Ltd. In case of heavy demand, fixed cost remained unchanged, Mim Ltd will cover the fixed cost quickly compared with Alif Ltd. and will generate higher profit. On the contrary, all other things remained unchanged, Alif Ltd. will likely to earn greater profit in the condition of low demand as Alif Ltd. has low fixed cost compared to Mim Ltd. As such Alif Ltd. will likely to cover the fixed cost earlier compared with Mim Ltd. and will likely to generate greater profit.

CamScanner

2 (b)

Safa Manufacturing
Statement of Cashflow (Indirect Method)
For the Year Ended 31 December 2022

	Tk.
A. Cashflow from Operating Activities:	
Net income	450,000
Add: Depriciation	125,000
Add: Decrease in Receivable (350,000-281,250)	68,750
Less: Increase in Inventory (150,000-125,000)	(25,000)
Less: Decrease in Payable (300,000-237,500)	(62,500)
Less: Gain in Sale of Equipment	(50,000)
Net Cashflow Operating Activities -	506,250
B. Cashflow from ~~Financing~~ Investing Activities:	
Sale of Equipment	175,000
(-) Purchase during the period	(137,500)
(-) Purchase of land (718,750-500,000)	(218,750)
Net cashflow from Investing Activities	(181,250)
C. Cashflow from Financing Activities:	
Issuance of Mortgage	250,000
Dividend paid during the period	(225,000)
Net cashflow from financing activities	25,000
Net cash (A+B+C)	350,000

CamScanner

3(b) We are given,

Earning Before Interest and Tax (EBIT)	TK. 179,200
Less: Interest on 16% Bond (16% of TK. 120,000)	(19,200)
Earning Before Tax (EBT)	TK. 160,000
Less: Tax @ 40% on EBT (40% of 160,000)	TK. 64,000
Net Profit after tax →	TK. 96,000

(i) Return on Equity (ROE) $= \frac{\text{Net profit after Tax}}{\text{Shareholders Equity}}$

Shareholder Equity = (Common Stock + Share Premium + Retained Earnings)
= (420,000 + 240,000 + 180,000)
= 840,000

$= \frac{96,000}{(420,000 + 240,000 + 180,000)}$

$= 96,000/840,000 = 0.1143 = 11.43\%$

(ii) Time Interest Earned Ratio = EBIT / Interest Expenses

$= 179,200/19,200 = 9.33$ times

(iii) Earning Per share (EPS) = Net profit After Tax / No of outstanding shares

$= 96,000/16,800 =$ TK. 5.71/Share

(iv) Price-Earning Ratio (P/E Ratio) = Price per share / Earnings per share

Market price/share => TK. 35

$= 35/5.71 = 6.13$ times

(v) Book Value/share $= \frac{\text{Shareholders Equity}}{\text{No. of outstanding shares}}$

$= \frac{840,000}{16,800}$

= TK. 50/Share

CamScanner

5 (b) We are given,

Cost of Vehicle = Tk. 45,00,000
Client's Equity 30% of cost = 13,50,000

HPSM Investment Tk. 31,50,000

No of Year(n) = 7
Rate of Return (i) = 9% per annum
Installment yearly at the end of each year

We know,

$PVA = PMT(PVIFA_{i\%, n\ year})$ where PVA = Present Value of Annuity which is the HPSM investment
PMT = Periodic Payment or Installment

$\Rightarrow 31,50,000 = PMT(PVIFA_{9\%, 7\ year})$

$\Rightarrow 31,50,000 = PMT \times 5.0330$ [From PVIFA Table]

$\Rightarrow PMT = 31,50,000/5.0330$ = Tk 625,869

Thus Installment size will be Tk. 625,869

(c) (i) We are given, Deposit Amount = Tk. 10,000
Provisional Rate of profit (i) = 6.50% (3 month MTDR), 6.75% (6 month MTDR and 6.85% (12 month MTDR)

Period (n) = 3 years

FV_3 = Future Value after 3 years
Here m = No of compounding in a year = 4

Now, FV_3 (3 month MTDR) $= PV_0[1+(i/m)]^{mn}$

$= 10,000[1+.065/4]^{4\times3}$

= Tk. 12,134.

FV_3 (6 month MTDR) $= PV_0[1+i/m]^{mn}$ | Here m = 2

$= 10,000[1+0.0675/2]^{2\times3}$

= Tk. 12,203

FV_3 (12 month MTDR) $= 10,000[1+0.0685/1]^{3\times1}$ | Here m = 1 since yearly compounding

= Tk. 12199

(ii) Effective Annual Interest Rate (EAIR) $= [1+i/m]^m - 1$

Now,

EAIR (3 month MTDR) $= [1+.065/4]^4 - 1 = 6.66\%$

EAIR (6 month MTDR) $= [1+.0675/2]^2 - 1 = 6.86\%$

EAIR (12 months MTDR) $= [1+.0685/1]^1 - 1 = 6.85\%$

From the above calculation we see that 6 month MTDR's EAIR is higher among all the alternatives. Thus we should go for plan-2 i.e deposit in 6 months MTDR.

CS CamScanner

7 (b) We are given.

Cost of Machine = TK. 500,000

Expected Life of Machine = 5 years

Salvage Value (SV) = Tk 50,000, Cost of capital = 15%, Tax Rate = 50%

Calculation of depriciation of machine/year = (Cost of Machine − Salvage Value) / No of years of machine

= Tk (500,000 − 50,000)/5

= Tk 90,000 / year

Year (1)	Cash flow before Tax and dep (2)	Depriciation (3)	EBT (4) (2−3)	Tax @ 50% 5 = 50% of 4	EAT (6) = 4−5	Net cash Benefit 7 = 6+3	Cumulative cash flow (8)	PVIF 15%, 5y (9)	PV of NCB (10) 10 = 7×9
1	200,000	90,000	110,000	55,000	55,000	145,000	145,000	0·8696	126,092
2	200,000	90,000	110,000	55,000	55,000	145,000	290,000	0·7561	109,635
3	250,000	90,000	160,000	80,000	80,000	170,000	460,000	0·6575	111,775
4	225,000	90,000	135,000	67,500	67,500	157,500	617,500	0·5718	90,059
5	150,000	90,000	60,000	30,000	30,000	120,000	737500	0·4972	59,664
5	50,000 (SV)	−	−					0·4972	24,860

PV of NCB	522,085
Less: Cash outflow	500,000
NPV	Tk. 22,085

(i) Payback Period = Full years Untill Recovery + $\frac{\text{Uncovered cost at the beging of recovery period}}{\text{Cashflow during recovery period}}$

$= 3 + \frac{(500,000 - 460,000)}{157,500}$ years

$= 3 + 0·2539$ years $= 3·25$ years or 3 years 3 month (app)

(ii) Using the NPV method of capital budgeting technique as calculated above, we can say that it will be wise to purchase the machine as it has positive NPV of TK. 22085.

CS CamScanner

8(b) We are given.

Ordinary share = Tk. 80,00,000,
10% Preference share = Tk. 20,00,000
14% Debenture = Tk. 60,00,000
Share price = Tk. 20/share, Dividend of next year (D_1) = Tk. 2/share
Growth rate = 5%, Tax Rate = 40%

Now, Cost of Common Stock (k_e) = $\frac{D_1}{\text{Share price}}$ + Growth Rate | Considering Dividend Growth Model

$= \frac{2}{20} + .05$

$= 0.15$ or 15%

Cost of Preference Share = 10% = 0.10

Cost of debt/debenture (D_e) = $D_c(1 - \text{Tax Rate})$ | Here D_c = Original cost of debenture

$= 0.14(1-0.40) = 0.084$ or 8.40%

(i) Weighted Average Cost of capital:

Particulars(1)	Amount(2)	Weight(3)	Cost(4)	Weighted Cost(5) = 3X4
Ordinary share	80,00,000	0.50	0.15	0.0750
10% Preference Share	20,00,000	0.125	0.10	0.0125
14% Debenture	60,00,000	0.375	0.084	0.0315
	160,00,000	1.00	WACC =	0.119 or 11.90%

(ii) Cost of Addition Debt (Subordinated bond) (D_s) = $0.15(1-.40) = 0.09 = 9\%$

Revised Cost of Common Stock (K_{er}) = $\frac{D_1}{\text{Share Price}} + G$ | Here D_1 = 3 Tk. Share Price = 15 Tk. G = 5% (Unchanged)

$= \frac{3}{15} + .05$

$= 0.25$ or 25%

Now, revised Weighted Average Cost of Capital:

Particulars(1)	Amount(2)	Weight(3)	Cost(4)	Weighted Cost(5) = 3X4
Ordinary share	80,00,000	0.40	0.25	0.1000
10% Preference Share	20,00,000	0.10	0.10	0.0100
14% Debenture	60,00,000	0.30	0.084	0.0252
Subordinated Bond	40,00,000	0.20	0.090	0.0180
	200,00,000	1.00	WACC =	0.1532 = 15.32%

CS CamScanner

MANAGEMENT ACCOUNTING & FINANCIAL MGT.
DIPLOMA IN ISLAMIC BANKING, NOV-2022
SOLUTIONS OF QUESTIONS

1.c)

Ref	Calculation of Cost		Amount in Tk.
1	Raw Material used		40,000
2	Direct Wages	(1400*20)	28,000
3	Direct Expensses		70,000
4	**Prime cost (1+2+3)**		**138,000**
5	**Factory Overheads**		
6	Indirect Material		40,000
7	Indirect Labour		90,000
8	**Total Facotry Overheads (6+7)**		**130,000**
9	**Total Manufacturing Cost (4+8)**		**268,000**
10	+WIP (BB)		50,000
11	-WIP (CB)		60,000
12	**Cost of Goods Manufactured (9+10-11)**		**258,000**
13	+Finished Goods(BB)		140,000
14	-Finished Goods (CB)		80,000
15	**Cost of Goods Sold (12+13-14)**		**318,000**
16	Fixed Administrative Expenses	60,000	
17	Variable (10% of Prime Cost)	13,800	
18	**Total Administrative Expenses (16+17)**		**73,800**
19	Fixed Selling Expenses	30,000	
20	Variable (5% of COGM)	12,900	
21	**Total Selling Expenses (19+20)**		**42,900**
22	**Total Cost (15+18+21)**		**434,700**
23	**Sales [Total Cost/(1-Profit Rate]**		**511,412**

Particulars		
Raw material used		40,000
Work in Process-Beginning		50,000
Work in Process-Ending		60,000
Finished Goods-Beginning		140,000
Finished Goods-Closing		80,000
Direct Wages		1,400 Hours @ Tk.20 per Hour
Direct Expenses		70,000
Indirect Material		40,000
Indirect Labour		90,000
General & Administrative Expense:		
Fixed		60,000
Variable		
Marketing Expenses		
Fixed		
Variable	5% of Cost of Goods Manufactured	
Profit	**15% on Sales**	

2(b) We are given,

Particulars	Company A	Company B
Capacity Utilization	85%	80%
Sales	Tk. 60,00,000	Tk. 50,00,000
Variable Cost	Tk. 40,00,000	Tk. 35,00,000
Fixed Cost	Tk. 10,00,000	Tk. 8 00,000

(i)

	Company A	Company B
Contribution Margin = Sales − Variable Cost	60,00,000−40,00,000 = 20,00,000 Tk.	50,00,000−35,00,000 = 15,00,000 Tk.
Contribution Margin Ratio (CMR)	= 20,00,000/60,00,000 = 33·33%	= 15,00,000/50,00,000 = 30%
Break-Even Sales (Fixed cost/CMR)	= 10,00,000/33·33% = 30,00,300 Tk.	= 800,000/30% = 26,66,666 Tk.

(ii) Merged Sales = (60,00,000 + 50,00,000) = 11 0,00,000 Tk.
Merged Variable Cost = (40,00,000 + 35,00,000) = Tk. 75,00,000
Merged Fixed cost = (10,00000 + 800,000) = Tk. 18,00,000
Merged Contribution Margin = (110,00,000 − 75,00,000) = Tk. 35,00,000
Merged Contribution Margin Ratio = 35,00,000/110,00,000 = 31·82%
Break-Even Sales of Merged plant = 18,00,000/31·82% = 56,56,820

(iii)

	Company-A	Company-B
Sales @ 90% capacity utilization	$\frac{60,00,000}{85} \times 90$ = 63,52,941	$\frac{50,00,000}{80} \times 90$ = 56,25,000
Variable cost Ratio	40,00,000/60,00,000 = 0·67	= 35,00,000/50,00,000 = 0·70

Merged Sales @ 90% capacity utilization = (63,52,941 + 56,25,000) = 11,97,7,941

Variable cost @ 90% Capacity utilization (63,52,941 × ·67) = 42,56,470 Tk. (56,25,000 × ·70) = 39,37,500 Tk

Merged Variable cost = (42,56,470 + 39,37,500) = Tk. 81,93,970
Merged contribution Margin = (119,77,941 − 81,93,970) = Tk. 37,83,971.
Contribution Margin Ratio = (3783971/11977941) = 31·59%.
Profit of merged ~~sales~~ plant @ 90% capacity = (37,83,971 − 18,00,000) = Tk. 19,83,971

[Due to taking decimals, the answer might deviate; However marks may be given, if the process is correct]

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(IV) In order to earn profit of TK. 25,00,000 from the merged plant, the sales turnover will be –

$$\text{Sales Turnover} = \frac{\text{Fixed Cost} + \text{Desired Profit}}{\text{Contribution Margin Ratio}}$$

Contribution Margin Ratio = 31.82% [From I]

$$= \frac{(10,00,000 + 800,000 - 300,000) + 2500,000}{0.3182}$$

$$= (15,00,000 + 2500,000)/0.3182$$

$$= \text{Tk.} 1,25,70,710$$

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3(b)(i) Net Income Margin = $\frac{\text{Net income}}{\text{Sales}}$

$= \frac{500,000}{32,00,000} = 15.62\%$

(ii) Current Ratio = $\frac{\text{Current Assets}}{\text{Current liabilities}}$

$= \frac{16,50,000}{13,50,000} = 1.22$ times

(iii) Acid Test Ratio = $\frac{\text{Current Assets} - \text{Inventory}}{\text{Current liability}}$

$= \frac{16,50,000 - 50,000}{13,50,000} = 1.19$ times

(iv) Long-Term Debt to Equity Ratio = $\frac{10,00,000}{30,00,000 + 500,000}$
= (Long term Debt/Equity)

$= 10,00,000/35,00,000 = 0.29$ times

(v) Time Interest Earned Ratio = $\frac{\text{Earnings Before Interest and Tax}}{\text{Interest}}$

Interest = 10,00,000 @ 10% = 100,000
Since EBIT is not given we consider
Net Income = 500,000.
Since tax is to be ignored so it is also EBT
So EBIT = EBT + Interest = (500,000 + 100,000) = 600,000

$= \frac{600,000}{100,000} = 6$ times

(* If anyone calculate EBIT from NI adding back the interest it will be acceptable since operating expenses is not given)

(vi) Return on Assets (ROA) = $\frac{\text{Net income}}{\text{Total Assets (Current + Fixed Assets)}}$

$= 500,000/(16,50,000 + 47,00,000)$

$= 500,000/6350,000 = 7.87\%$

(vii) Return on Equity (ROE) = Net Income / Shareholders Equity

$= 500,000/(30,00,000 + 500,000)$

$= 500,000/35,00,000 = 14.28\%$

(viii) Price-Earning (P/E) Ratio = M. Price Per share / Earnings Per share

Earning per share = Net income/No. of share = 11.20/1.67
= 500,000/300,000 = 6.71 times
= 1.67

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4)

Month of 202A	Sales	Raw Material	Wages	Overhead
January	150,000	75,000	10,000	25,000
February	160,000	80,000	11,000	26,000
March	170,000	85,000	12,000	30,000
April	180,000	90,000	13,000	31,000
May	190,000	95,000	14,000	32,000
June	200,000	100,000	15,000	33,000

Ref	Cash Budget April-June 202A				
	Particulars	**April**	**May**	**June**	**Quarter (April-June)**
1	Cash in Hand (OB)	100,000	113,000	138,500	100,000
2=3+4+5	**Sales**	**166,000**	**175,500**	**185,000**	**526,500**
3	60% Current Month	108,000	114,000	120,000	
4	20% Previous Month	34,000	36,000	38,000	
5	15% Before Previous Month	24,000	25,500	27,000	
6	**Expenses:**				
7	Raw Material (2 Months Credit)	80,000	85,000	90,000	255,000
8	Wages (No Lag in Payment)	13,000	14,000	15,000	42,000
9	Overheads (1 Month Lag in Payment)	30,000	31,000	32,000	93,000
10	Plant	10,000	10,000	10,000	30,000
11	Research Expenditure	10,000			10,000
12	Hire Purchase	10,000	10,000	10,000	30,000
13	Payment of Tax			100,000	100,000
14	Dividend Income			50,000	50,000
15=2+14	**Total Cash Inflow**	**166,000**	**175,500**	**235,000**	**576,500**
16=7 to13	**Total Cash outflow**	**153,000**	**150,000**	**257,000**	**560,000**
17=1+15-16	**Cash in Hand (OB+Inflow-Outflow)**	**113,000**	**138,500**	**116,500**	**116,500**

5(a) We are given, PMT = Grant = TK. 300,000. n = 10 years.
i = Rate of Return = 6% (Annually)
We have to find out the Present Value i.e PVA
We know,

$PVA = PMT \times PVIFA_{i, n\ years}$

$= 300{,}000 \times PVIFA_{6\%, 10\ year}$ [Considering ordinary Annuity]

$= 300{,}000 \times 7.3601$ [From PVIFA Table 6%, 10 years]

$= 22{,}08{,}030$ TK. (Ans)

(b) Requirement of Fund TK. 10,00,000 after 5 years
Salvage Value TK. 200,000
Actual Requirement TK. 800,000 which is FVA
i = Rate of Return = 8% (Annually)
n = Number of years = 5, We have to find out PMT = Installment in each year

We know, $FVA = PMT \times FVIFA_{i\%, n\ years}$

$\Rightarrow 800{,}000 = PMT \times FVIFA_{8\%, 5\ years}$ [Considering ordinary Annuity]

$\Rightarrow 800{,}000 = PMT \times 5.8666$ [From FVIFA table @ 8%, 5 years]

$\Rightarrow PMT = 800{,}000 / 5.8666 =$ TK. 136,365 (Ans)

(c) Price of Flat = TK. 55,00000
Downpayment = TK. 15,00,000
Balance = PVA = TK 40,00000
n = No. of years = 15, i = Rate of Profit = 10%

We know

$PVA = PMT \times PVIFA_{i, n\ year}$

$\Rightarrow 40{,}00{,}000 = PMT \times PVIFA_{10\%, 15\ years}$

$\Rightarrow 40{,}00{,}000 = PMT \times 7.6061$ [From PVIFA table @ 10%, 15 years]

$\Rightarrow PMT = 40{,}00{,}000 / 7.6061$

$= 525{,}894$ TK. (Ans)

(6) (e) Cost of Debt (K_d) = Cost × (1 − Tax Rate)

= '08 × (1 − '3750)

= '05 = 5%

Cost of Preference Share (K_p) = 9% = '09

Cost of Common Equity by using CAPM Model

$K_e = K_F + \beta (K_M - K_F)$

= '04 + 1·2 ('12 − '04)

= 0'136 = 13·60%

Where,
K_F = Risk Free Rate = '04
β = Beta = 1·20
K_M = Market Return = 12% = '12

Cost of Retained Earnings K_{re} = Cost of Equity = 13·60%

Source of Capital	Book Value	Weight	Cost	Weighted Cost
8% Debt	200,000	0'2352	'05	0'0117
9% Preference Share	100,000	0'1176	'09	0'0105
Common Equity	200,000	0'2352	'136	0'0319
Retained Earnings	350,000	0'4120	'136	0'0560
Total	850,000	1'000	WACC =	0'1101 = 11'01%

WACC = 11·01%

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7(b)

① Year	② Cash flow A	③ Cash flow B	④ Cumulative Cash flow-A	⑤ Cumulative Cash flow-B	⑥ PV@12%	⑦ PV@15%	⑧ = 6×2 @12% PV of Project A	⑨ = 7×2 @15% PV of Project-A	⑩ = 6×3 @12% PV of Project-B	⑪ = 7×3 15% PV of Project-B
1	14,000	23,000	14,000	23,000	0.8929	0.8696	12,500	12174	20,537	20,001
2	14,000	12,000	28,000	35,000	0.7972	0.7561	11,161	10,585	9566	9,073
3	14,000	10,000	42,000	45,000	0.7118	0.6575	9965	9205	7,118	6575
4	14,000	9,000	56,000	54,000	0.6355	0.5718	8897	8,005	5720	5,146
						PV	42,523	39,969	42,941	40,795
						(−) Initial Investment	40,000	40,000	40,000	40,000
						NPV	2,523	(31)	2941	795

(i) Payback Period (PBP) $= A + \frac{NCO - C}{D}$

Project A (PBP) $= 2 + \frac{40,000 - 28,000}{14,000} = 2.85$ years

Project B (PBP) $= 2 + \frac{40,000 - 35,000}{10,000} = 2.50$ years

(ii) IRR $= A + \frac{C}{C-D}(B-A)$

Project A (IRR) $= .12 + \frac{2523}{2523+31}(.15 - .12)$

$= 14.96\%$

Project B (IRR) $= .12 + \frac{2941}{2941-795}(.15 - .12)$

$= 16.11\%$

(iii) Profitability Index (PI) = $\frac{\text{Present Value of Cash Inflow}}{\text{Present Value of Cash outflow}}$

PI of Project A $= \frac{42,523}{40,000} = 1.06$

PI of Project B $= \frac{42,941}{40,000} = 1.07$

(iv) As per calculation, NPV of Project A = 2523 and NPV of project B = 2,941. Thus, both the projects are accepted. But if there is capital/budget constraint project-B should be accepted as it generates higher NPV, IRR and PI compared to project-A.

[Note: Due to taking decimals, the answer might deviate. However marks may be given if the process is correct]

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